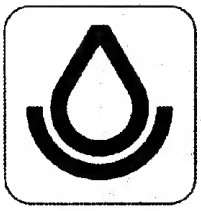
SOIL SURVEY OF

Geneva County, Alabama



United States Department of Agriculture
Soil Conservation Service
in cooperation with
Alabama Agricultural Experiment Station
and
Alabama Department of Agriculture
and Industries

This is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and agencies of the States, generally the Agricultural Experiment Stations. In some surveys, other Federal and local agencies also contribute. The Soil Conservation Service has leadership for the Federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in the period 1969–72. Soil names and descriptions were approved in 1973. Unless otherwise indicated, statements in the publication refer to conditions in the county in 1972. This survey was made cooperatively by the Soil Conservation Service, the Alabama Agricultural Experiment Station, and the Alabama Department of Agriculture and Industries. It is part of the technical assistance furnished to the Geneva County Soil and Water Conservation District.

Soil maps in this survey may be copied without permission, but any enlargement of these maps could cause misunderstanding of the detail of mapping and result in erroneous interpretations. Enlarged maps do not show small areas of contrasting soils that could have been shown at a larger mapping scale.

HOW TO USE THIS SOIL SURVEY

THIS SOIL SURVEY contains information that can be applied in managing farms, ranches, and woodlands; in selecting sites for roads, ponds, buildings, and other structures; and in judging the suitability of tracts of land for farming, industry, and recreation.

Locating Soils

All the soils of Geneva County are shown on the detailed map at the back of this publication. This map consists of many sheets made from aerial photographs. Each sheet is numbered to correspond with a number on the Index to Map Sheets.

On each sheet of the detailed map, soil areas are outlined and are identified by symbols. All areas marked with the same symbol are the same kind of soil. The soil symbol is inside the area if there is enough room; otherwise, it is outside and a pointer shows where the symbol belongs.

Finding and Using Information

The "Guide to Mapping Units" can be used to find information. This guide lists all the soils of the county in alphabetic order by map symbol and gives the capability unit and woodland suitability group in which the soil has been placed.

Individual colored maps showing the relative suitability or degree of limitation of soils for many specific purposes can be developed by using the soil map and the information in the text. Translucent material can be used as an overlay over the soil map and colored to show soils that have the same limitation or suitability. For example, soils that have a slight limitation for a given use can be colored green, those with a moderate limitation can be colored yellow, and those with a severe limitation can be colored red.

Farmers and those who work with farmers can learn about use and management of the soils from the soil descriptions and from the discussions of the capability units.

Foresters and others can refer to the section "Use of the Soils for Woodland," where the soils of the county are grouped according to their suitability for trees.

Game managers, sportsmen, and others can find information about soils and wildlife in the section "Interpretations of the Soils for Wildlife Habitat."

Community planners and others can read about soil properties that affect the choice of sites for dwellings, industrial buildings, and recreation areas in the section "Town and Country Planning."

Engineers and builders can find, under "Engineering Uses of the Soils," tables that contain test data, estimates of soil properties, and information about soil features that affect engineering practices.

Scientists and others can read about how the soils formed and how they are classified in the section "Formation, Morphology, and Classification of the Soils."

Newcomers in Geneva County may be especially interested in the section "General Soil Map," where broad patterns of soils are described. They may also be interested in the information about the county given at the beginning of the publication and in the section "Climate."

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UNITED STATES DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE, IN COOPERATION WITH THE ALABAMA AGRICULTURAL EXPERIMENT STATION AND THE ALABAMA DEPARTMENT OF AGRICULTURE AND INDUSTRIES

GENEVA COUNTY is in the southeast corner of Alabama (fig. 1). It has a land area of 578 square miles, or 369,920 acres. In 1970 the population of the county was 21,337. Geneva, the county seat and largest town, is in the south-central part of the county.

All of the county is on the Coastal Plain. The elevation ranges from about 70 feet above sea level along the Choctawhatchee River in the south-central part of the county to about 300 feet at several points along the northern boundary. The topography is mainly level to gently sloping, but sloping areas are common in the northern part of the county.

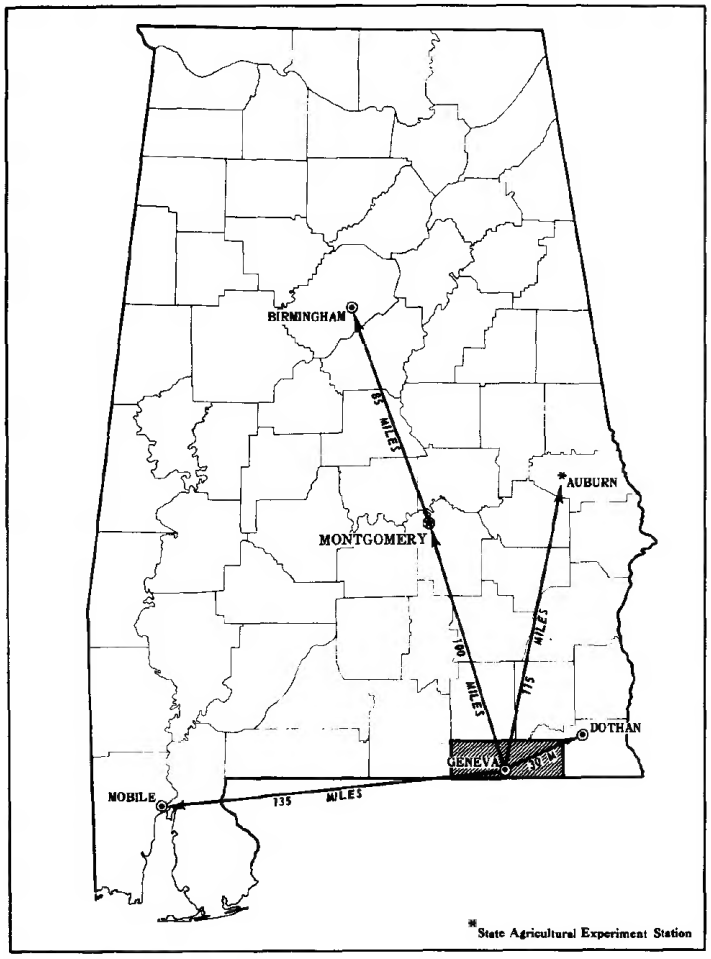

Figure 1.—Location of Geneva County in Alabama.

The climate in the county is temperate and humid. Summers are long and hot. Winters are relatively mild, and extended periods of severe cold are rare. Rainfall is generally well distributed throughout the year. Average annual rainfall is 54 inches.

About 52 percent of the county is used for row crops or for pasture. Corn, small grain, and peanuts are the main crops. Beef cattle and hogs are the principal livestock.

All of the soils are well suited to row crops, pasture, and trees. The sandy area south of Samson and west of Geneva is droughty, and shallow-rooted row crops often produce low yields.

The eastern two-thirds of the county is drained by the Choctawhatchee River and its tributaties, and the western one-third by the Pea River and its tributaries.

The county is well served by roads, and hard surfaced, farm-to-market roads reach every community.

How This Survey Was Made

Soil scientists made this survey to learn what kinds of soil are in Geneva County, where they are located, and how they can be used. The soil scientists went into the county knowing they likely would find many soils they had already seen and perhaps some they had not. They observed the steepness, length, and shape of slopes; the size and speed of streams; the kinds of native plants or crops; the kinds of rock; and many facts about the soils. They dug many holes to expose soil profiles. A profile is the sequence of natural layers, or horizons, in a soil; it extends from the surface down into the parent material that has not been changed much by leaching or by the action of plant roots.

The soil scientists made comparisons among the profiles they studied, and they compared these profiles with those in counties nearby and in places more distant. They classified and named the soils according to nationwide, uniform procedures. The *soil series* and the *soil phase* are the categories of soil classification most used in a local survey.

Soils that have profiles almost alike make up a soil series. Except for different texture in the surface

layer, all the soils of one series have major horizons that are similar in thickness, arrangement, and other important characteristics. Each soil series is named for a town or other geographic feature near the place where a soil of that series was first observed and mapped. Dothan and Troup, for example, are the names of two soil series. All the soils in the United States having the same series name are essentially alike in those characteristics that affect their behavior in the undisturbed landscape.

Soils of one series can differ in texture of the surface layer and in slope, stoniness, or some other characteristic that affects use of the soils by man. On the basis of such differences, a soil series is divided into phases. The name of a soil phase indicates a feature that affects management. For example, Dothan sandy loam, 2 to 5 percent slopes, is one of several phases within the Dothan series.

After a guide for classifying and naming the soils had been worked out, the soil scientists drew the boundaries of the individual soils on aerial photographs. These photographs show woodlands, buildings, field borders, trees, and other details that help in drawing boundaries accurately. The soil map at the back of this publication was prepared from aerial photographs.

The areas shown on a soil map are called mapping units. On most maps detailed enough to be useful in planning the management of farms and fields, a mapping unit is nearly equivalent to a soil phase. It is not exactly equivalent, because it is not practical to show on such a map all the small, scattered bits of soil of some kind that have been seen within an area that is dominantly of a recognized soil phase.

Some mapping units are made up of soils of different series, or of different phases within one series. Three such kinds of mapping units are shown on the soil map of Geneva County: soil complexes, soil associations, and undifferentiated groups.

A soil complex consists of areas of two or more soils, so intricately mixed or so small in size that they cannot be shown separately on the soil map. Each area of a complex contains some of each of the two or more dominant soils, and the pattern and relative proportions are about the same in all areas. Generally, the name of a soil complex consists of the names of the dominant soils, joined by a hyphen. Leaf-Lenoir complex is an example.

A soil association is made up of adjacent soils that occur as areas large enough to be shown individually on the soil map but are shown as one unit because the time and effort of delineating them separately cannot be justified. There is a considerable degree of uniformity in pattern and relative extent of the dominant soils, but the soils may differ greatly one from another. The name of an association consists of the names of the dominant soils, joined by a hyphen. Bigbee-Kalmia-Eunola association is an example.

An undifferentiated group is made up of two or more soils that could be delineated individually but are shown as one unit because, for the purpose of the soil survey, there is little value in separating them. The pattern and proportion of soils are not uniform. An area shown on the map may be made up of only one of the dominant soils, or of two or more. If there are two or more dominant series represented in the group, the name of the group ordinarily consists of the names of the dominant soils, joined by "and." Chastain and Bibb soils is an example.

While a soil survey is in progress, soil scientists take soil samples needed for laboratory measurements and for engineering tests. Laboratory data from the same kind of soil in other places are also assembled. Data on yields of crops under defined practices are assembled from farm records and from field or plot experiments on the same kind of soil. Yields under defined management are estimated for all the soils.

Soil scientists observe how soils behave when used as a growing place for native and cultivated plants, and as material for structures, foundations for structures, or covering for structures. They relate this behavior to properties of the soils. For example, they observe that filter fields for onsite disposal of sewage fail on a given kind of soil, and they relate this to the slow permeability of the soil or to its high water table. They see that streets, road pavements, and foundations for houses are cracked on a soil and they relate this failure to the high shrink-swell potential of the soil material. Thus, they use observation and knowledge of soil properties, together with available research data, to predict limitations or suitability of soils for present and potential uses.

After data have been collected and tested for the key, or benchmark, soils in a survey, the soil scientists set up trial groups of soils. They test these groups by further study and by consultation with farmers, agronomists, engineers, and others. They then adjust the groups according to the results of their studies and consultation. Thus, the groups that are finally evolved reflect up-to-date knowledge of the soils and their behavior under current methods of use and management.

General Soil Map

The general soil map at the back of this survey shows, in color, the soil associations in Geneva County. A soil association is a landscape that has a distinctive proportional pattern of soils. It normally consists of one or more major soils and at least one minor soil, and it is named for the major soils. The soils in one association may occur in another, but in a different pattern.

A map showing soil associations is useful to people who want a general idea of the soils in a county, who want to compare parts of a county, or who want to know the location of large tracts that are suitable for a certain kind of land use. Such a map is a useful general guide in managing a watershed, a wooded tract, or a wildlife area, or in planning engineering works, recreational facilities, and community developments. It is not a suitable map for planning the management of a farm or field, or for selecting the exact location of a road, building, or similar structure, because the soils in any one association ordinarily differ in slope, depth, stoniness, drainage, and other characteristics that affect their management.

The eight soil associations in Geneva County are discussed in the following paragraphs.

1. Dothan Association

Deep, well drained or moderately well drained, gently sloping soils, some contain plinthite at depths of 24 to 50 inches; on uplands.

This association consists of gently sloping soils on uplands of the Coastal Plain. One large area makes up the eastern third of the county, and the other area makes up the extreme western part of the county. The association is moderately dissected by intermittent and perennial streams. Within the association are many broad, nearly level to gently sloping soils on ridgetops and some undulating soils on narrow side slopes. Slopes dominantly range from 2 to 5 percent.

This association makes up about 31 percent of the county. It is about 71 percent Dothan soils and about 29 percent Ardilla, Esto, Fuquay, Orangeburg, and other minor soils.

Dothan soils are on broad ridgetops. They have a surface layer of brown sandy loam 6 inches thick over 20 inches of yellowish-brown sandy clay loam. Below this is 39 inches of yellowish-brown sandy clay loam that is mottled with strong brown, red, and pale brown and that contains plinthite.

Ardilla soils are at lower elevations at the bases of side slopes, adjacent to drainageways, or in slight depressions. Esto and Orangeburg soils are undulating on narrow side slopes and nearly level to gently sloping on ridgetops. Fuquay soils are nearly level to gently sloping on ridegtops.

Nearly all of the acreage of this association is well suited to and is used intensively for row crops. It is well suited to mechanized farming because slopes are smooth and fields are large. Good management practices are needed to control erosion and maintain a high level of soil fertility.

The soils in this association have slight to moderate limitations for recreational uses, foundations for dwellings, or habitat for game animals and wildlife. They have moderate to severe limitations for septic tank absorption fields, sewage lagoons, and sanitary landfills.

2. Dothan-Orangeburg Association

Deep, well drained or moderately well drained, gently sloping soils, some contain plinthite at depths of 24 to 50 inches; on uplands.

This association consists of gently sloping soils on uplands of the Coastal Plain. One area is east of Geneva and southwest of Hartford, and another is north of Geneva and extends west to the Pea River northwest of Samson. The association is moderately dissected by intermittent and perennial streams. Within the association are many moderately broad to broad, nearly level to gently sloping soils on ridgetops and some undulating soils on narrow side slopes. Slopes dominantly range from 2 to 5 percent.

This association makes up about 20 percent of the county. It is about 37 percent Dothan soils, about 33 percent Orangeburg soils, and about 30 percent Ardilla, Bonifay, Esto, Fuquay, and other minor soils.

Dothan soils are on ridgetops. They have a surface layer of brown sandy loam 6 inches thick over 20 inches of yellowish-brown sandy clay loam. Below this is 39 inches of yellowish-brown sandy clay loam that is mottled with strong brown, red, and pale brown and that contains plinthite.

Orangeburg soils are on ridgetops and side slopes. They have a surface layer of brown sandy loam 7 inches thick over 5 inches of yellowish-red sandy clay loam and 63 inches of red sandy clay loam.

Ardilla soils are at lower elevations at the base of side slopes, adjacent to drainageways, or in slight depressions. Bonifay and Fuquay soils are nearly level to gently sloping on ridgetops. Esto soils are undulating on knolls and side slopes.

Most of the acreage of this association is well suited to and is used intensively for row crops. It is generally well suited to mechanized farming because slopes are smooth and fields are large. Good management practices are needed to control erosion and maintain a high level of soil fertility.

This association is well suited to recreational uses, industrial development, or habitat for game animals and wildlife. Dothan soils in the association have moderate to severe limitations for septic-tank absorption fields, sewage lagoons, or sanitary landfills.

3. Orangeburg-Red Bay Association

Deep, well-drained, gently sloping to undulating soils; on uplands

This association consists of gently sloping to undulating soils on uplands of the Coastal Plain. It is in the north-central part of the county and is north of Hartford and east of Chancellor. It is dissected by intermittent and perennial streams. Within the association are some level soils on ridgetops; many broad, nearly level to gently sloping soils on ridgetops; and narrow, undulating soils on side slopes. Slopes range from 2 to 8 percent but are dominantly 2 to 5 percent.

This association makes up about 12 percent of the county. It is about 47 percent Orangeburg soils, about 24 percent Red Bay soils, and about 29 percent Bibb, Dothan, Esto, Osier, Troup, and other minor soils.

Orangeburg soils are on ridgetops and narrow side slopes. They have a surface layer of brown sandy loam 7 inches thick over 5 inches of yellowish-red sandy clay loam and 63 inches of red sandy clay loam.

Red Bay soils are on ridgetops and narrow side slopes. They have a surface layer of dark reddish-brown sandy loam 6 inches thick over 10 inches of dark reddish-brown sandy clay loam and 64 inches of dark-red sandy clay loam. Below this is 10 inches of red sandy clay loam.

Bibb and Osier soils are in narrow drainageways. Dothan and Esto soils are nearly level to gently sloping on ridgetops. Troup soils are nearly level on ridgetops and undulating on side slopes.

This association is well suited to and is used intensively for growing the common crops of the county. It is suited to mechanized row-crop farming because slopes are smooth and fields are large. Controlling

erosion and maintaining soil fertility are the main concerns of management.

This association has few limitations and is well suited to homesites, industrial development, and recreational uses such as parks, camps, playgrounds, golf courses, and fishing. A good supply of underground water and plentiful sites for surface storage of water offer good opportunities for cabins, homesites, and industrial development. This association has many quail, rabbit, dove, squirrel, raccoon, and fox, some deer, and a few turkeys.

4. Bonifay-Alaga-Troup Association

Deep, well-drained to somewhat excessively drained, nearly level to gently sloping soils that have loamy sand or sand more than 40 inches thick; on uplands

This association consists of nearly level to gently sloping soils on uplands of the Coastal Plain. The largest area is west of Geneva and south of Samson, and smaller areas are north, south, and east of Geneva and across the Pea River west of Samson. The association is dissected by common intermittent streams and a few perennial streams. The soils of this association do not occur in any pattern within the association. Slopes dominantly range from 0 to 5 percent.

This association makes up about 11 percent of the county. It is about 23 percent Bonifay soils, about 20 percent Alaga soils, about 19 percent Troup soils, and about 38 percent Ardilla, Bibb, Fuquay, Lucy, Osier, and other minor soils.

Bonifay soils have a surface layer of very dark grayish-brown loamy sand 6 inches thick. The subsurface layer is brownish-yellow loamy sand to a depth of 22 inches; light yellowish-brown loamy sand that is mottled with yellowish brown, light brownish gray, and yellowish red to a depth of 42 inches; and mottled light-gray and pale-brown sand to a depth of 56 inches. The subsoil is 14 inches of mottled yellowish-brown, pale-brown, strong-brown, and yellowish-red sandy clay loam that is 10 percent plinthite.

Alaga soils have a surface layer of very dark grayish-brown loamy sand 8 inches thick. The underlying material to a depth of 45 inches is light yellowish-brown loamy sand that is mottled with very pale brown. Below this is 35 inches of very pale brown sand that is mottled with light yellowish brown.

Troup soils have a surface layer of brown loamy sand 8 inches thick. The subsurface layer is brown loamy sand to a depth of 28 inches and strong-brown sand to a depth of 56 inches. The subsoil is 24 inches of yellowish-red sandy loam.

Ardilla soils are on foot slopes that are adjacent to drainageways or are in slight depressions. Bibb and Osier soils are in narrow drainageways. Fuquay and Lucy soils are on uplands.

Much of the acreage of nearly level soils in the association is used for growing the common row crops of the county. Most of the gently sloping soils are in low-quality hardwoods and some pines. The sandy texture, the droughtiness, and the low available water capacity are the main concerns of management.

The soils in this association have slight to moderate limitations for industrial development, foundations for dwellings, septic-tank absorption fields, and road construction. They have moderate limitations for recreational uses and severe limitations for sewage lagoons and sanitary landfills. They are fairly well suited to habitat for such game animals as quail, rabbit, dove, squirrel, deer, and turkey.

5. Ardilla Association

Deep, somewhat poorly drained, nearly level soils that contain plinthite at depths of 20 to 38 inches; on uplands

This association consists of nearly level soils on uplands. Areas are widely scattered in the western third of the county and in the area south of Slocomb. Slopes dominantly range from 0 to 2 percent.

This association makes up about 7 percent of the county. It is about 69 percent Ardilla soils and about 31 percent Byars, Dothan, Fuquay, Plummer, Rains, and other minor soils.

Ardilla soils are on upland flats, on foot slopes, and in depressions. They have a surface layer of very dark gray sandy loam 6 inches thick. The subsurface layer is brown sandy loam 5 inches thick. The subsoil is 9 inches of light yellowish-brown sandy loam over 18 inches of light yellowish-brown sandy clay loam mottled with light gray. Below this is 12 inches of light-gray sandy clay loam mottled with light yellowish brown and strong brown. The next 20 inches is mottled strong-brown, light-gray, and red sandy clay loam.

Byars, Plummer, and Rains soils are in depressions, on uplands flats, or in drainageways. Dothan and Fuquay soils are on uplands.

This association is used dominantly for forest or pasture. It is better suited to pasture than to row crops because of wetness. Where surface drainage is good, the association is suited to the common row crops of the county. Wetness and a seasonal high water table are the main concerns of management.

The soils in this association have moderate limitations for recreational uses such as playgrounds, camp areas, and picnic areas. They have severe limitations for homesites and other building construction. They are well suited to habitat for such game animals as quail, rabbit, deer, turkey, dove, and squirrel.

6. Fuquay Association

Deep, well-drained, nearly level to gently sloping soils that have loamy sand to a depth of 21 to 38 inches and that contain plinthite at depths of 23 to 50 inches; on uplands

This association consists of nearly level to gently sloping soils on uplands. One area is 6 miles south of Hartford, and another is just south and east of Samson. Slopes dominantly range from 1 to 5 percent.

This association makes up about 3 percent of the county. It is about 44 percent Fuquay soils and about 56 percent Ardilla, Bonifay, Dothan, Lucy, Rains, and other minor soils.

Fuquay soils are on uplands. They have a surface

layer of dark grayish-brown loamy sand 9 inches thick. The subsurface layer is yellowish-brown loamy sand 14 inches thick. The upper 10 inches of the subsoil is yellowish-brown sandy loam; the next 11 inches is yellowish-brown sandy clay loam; the next 12 inches is strong-brown sandy clay loam that is mottled with brownish yellow, yellowish red, and light gray and is 20 percent plinthite; and the lower 24 inches is mottled yellow, light-gray, strong-brown, and red sandy clay loam.

Ardilla soils are on foot slopes, adjacent to drainageways, or in slight depressions. Dothan, Lucy, and Bonifay soils are on uplands. Rains soils are in depressions, on upland flats, or along drainageways.

Most of the acreage of this association is well suited to and is used for the common crops of the county. Some areas are in pasture and some in forest. Maintaining fertility and controlling erosion are the main concerns of management.

The soils in this association have slight limitations for homesites. They have moderate limitations for recreational uses such as camp areas, picnic areas, and playgrounds. They have severe limitations for septic tank absorption fields, sewage lagoons, and sanitary landfills.

The association is well stocked with and well suited to such game animals as quail, dove, rabbit, and squirrel.

7. Kalmia-Eunola-Alpin Association

Deep, moderately well drained to excessively drained, nearly level soils, some are subject to flooding; on stream terraces

This association consists of nearly level soils on stream terraces. It is along the Choctawhatchee and Pea Rivers and Double Bridges Creek. It is dissected by perennial and intermittent streams. Slopes dominantly range from 0 to 2 percent.

This association makes up about 10 percent of the county. It is about 20 percent Kalmia soils, about 16 percent Eunola soils, about 15 percent Alpin soils, and about 49 percent Bibb, Bigbee, Leaf, Lenoir, Osier, Plummer, and other minor soils.

Kalmia soils are at intermediate or higher elevations. They have a surface layer of dark grayish-brown loamy sand 7 inches thick. The upper 4 inches of the subsoil is light olive-brown sandy loam, the next 19 inches is yellowish-brown sandy clay loam, and the next 7 inches is brownish-yellow sandy loam mottled with yellowish brown and strong brown. Below this is 43 inches of light-gray sand.

Eunola soils are at intermediate or lower elevations. They have a surface layer of dark grayish-brown sandy loam 5 inches thick. The upper 21 inches of the subsoil is yellowish-brown sandy loam and sandy clay loam; the next 26 inches is mottled yellowish-brown, light yellowish-brown, light-gray, and yellowish-red sandy clay loam; and the lower 4 inches is brownish-yellow sandy loam mottled with very pale brown. The underlying material is 9 inches of mottled white, very pale brown, brownish-yellow, and yellowish-red sand.

Alpin soils are at higher elevations. They have a surface layer of dark-brown and brown sand 17 inches thick. The subsurface layer is 31 inches of brown and brownish-yellow sand. Below this is 16 inches of brownish-yellow and white sand that contains few to common lamellae. The next 20 inches is yellow and white sand.

Bibb, Leaf, Lenoir, Osier, and Plummer soils are at lower elevations in depressions, on moderately broad flats, and in narrow drainageways. Bigbee soils are on natural stream levees and higher knolls.

About half of the acreage of this association is used for and is suited to row crops and pasture. The association is well suited to mechanized row crop farming because slopes are smooth and fields are large.

Most of the better drained soils in the association have few limitations for recreational uses such as parks, camps, and playgrounds, but Alpin soils have severe limitations. The limitation for foundations for buildings is slight, but for such uses as septic tank absorption fields, sanitary landfills, and sewage lagoons, the limitations are dominantly severe. About one-third of the acreage of this association is on flood plains of major streams, and flooding is common for short durations late in winter or early in spring. All of this acreage is in mixed hardwoods and some pines. Row crops are not well suited because of the hazard of flooding. This part of the association has severe limitations for recreational uses, building construction, septic tank absorption fields, sewage lagoons, and sanitary landfills because of the hazard of flooding.

This association has dominantly high potential for production of trees of good commercial value. It is also well suited to habitat for such game animals as quail, rabbit, dove, squirrel, raccoon, deer, and turkey. An abundant supply of surface and underground water offers good opportunities for industrial development, homesites, cabins, and fishing development.

8. Bibb-Osier Association

Deep, poorly drained and very poorly drained, nearly level soils; on flood plains

This association consists of nearly level soils on long, narrow flood plains that are dominantly along the larger creeks and their tributaries. The soils are adjacent to gently sloping to sloping soils on uplands. They are subject to frequent flooding after prolonged or heavy rainfall, and the water table is within 10 inches of the surface more than 6 months of the year.

This association makes up about 6 percent of the county. It is about 40 percent Bibb soils, about 20 percent Osier soils, and about 40 percent Ardilla, Byars, Chastain, Grady, Plummer, Rains, and other minor soils.

Bibb soils have a surface layer of dark-gray silt loam 8 inches thick. The underlying material extends to a depth of 65 inches. The upper 17 inches is dark-gray sandy loam that has strata of light-gray silt loam to loamy sand. The next 10 inches is dark-gray loam that has strata of brownish-yellow and strong-brown silt loam to loamy sand. The next 11 inches is gray sandy loam. Below this is gray sandy loam mottled with light brownish gray to a depth of 60 inches and

yellowish-brown sand that has splotches of yellowish red to a depth of 65 inches.

Osier soils have a surface layer of dark-gray loam 7 inches thick. The underlying material extends to a depth of 65 inches. The upper 21 inches is dark-gray loamy sand that is mottled with light gray and has thin strata of gray sandy loam; the next 22 inches is mottled dark-gray, light-gray, and yellowish-brown sand; and the lower 15 inches is mottled light-gray and grayish-brown sand.

Ardilla soils are on foot slopes. Byars and Grady soils are on uplands in the eastern third of the county. Chastain soils are dominantly along the Choctawhatchee River south and east of Bellwood. Plummer soils are along drainageways and on uplands in the central part of the county. Rains soils are on uplands and along drainageways in the eastern third of the county.

Nearly all of the acreage of this association is in hardwoods. It is better suited to this use than to most others and has a high potential to produce quality hardwoods.

This association has severe limitations for industrial development, homesites, recreational areas, septic tank absorption fields, sewage lagoons, and sanitary landfills. Most of it is suited to habitat for such game animals as deer, squirrel, turkey, and raccoon. It has a fair potential for producing habitat for other wildlife such as rabbit, dove, and quail and is well suited to ducks, geese, muskrat, mink, and beaver.

Descriptions of the Soils

In this section the soils of Geneva County are described in detail and their use and management are discussed. Each soil series is described in detail, and then, briefly, the mapping units in that series are described. Unless it is specifically mentioned otherwise, it is to be assumed that what is stated about the soil series holds true for the mapping units in that series. Thus, to get full information about any one mapping unit, it is necessary to read both the description of the mapping unit and the description of the soil series to which it belongs.

An important part of the description of each soil series is the soil profile, that is, the sequence of layers from the surface downward to rock or other underlying material. Each series contains two descriptions of this profile. The first is brief and in terms familiar to the layman. The second is much more detailed and is for those who need to make thorough and precise studies of soils. The profile described in the soil series is representative of mapping units in that series. If a given mapping unit has a profile in some ways different from the one described in the series, these differences are stated in the description of the mapping unit, or they are apparent in the name of the mapping unit. The description of each mapping unit contains suggestions on how the soil can be managed. Color terms are for moist soil unless otherwise stated.

Following the name of each mapping unit is a symbol in parentheses. This symbol identifies the mapping unit on the detailed soil map. Listed at the end of the description of each mapping unit are the capability unit and woodland suitability group in which the mapping unit has been placed. Specific management of the soil for crops or trees is given at the mapping unit level.

The acreage and proportionate extent of each mapping unit are shown in table 1. Many of the terms used in describing soils can be found in the Glossary, and more detailed information about the terminology and methods of soil mapping can be obtained from the Soil Survey Manual (*5*).[1]

Alaga Series

The Alaga series consists of deep, well-drained and somewhat excessively drained soils on uplands. These soils have slopes of 0 to 5 percent. They formed in marine deposits of unconsolidated loamy sand and sand. Elevations range from 100 to 200 feet.

In a representative profile the surface layer is 8 inches of very dark grayish-brown loamy sand. The underlying material extends to a depth of 80 inches. It is light yellowish-brown loamy sand that is mottled with very pale brown in the upper 37 inches and very pale brown sand that has pockets of light yellowish-brown material in the lower 35 inches.

Alaga soils have low available water capacity and rapid permeability. Organic-matter content is very low, and natural fertility is low. The native vegetation was mostly low-quality hardwoods and pines. Much of

TABLE 1.—*Approximate acreage and proportionate extent of the soils*

Soil	Acres	Percent
Alaga loamy sand, 0 to 5 percent slopes	12,053	3.2
Alpin sand, 0 to 3 percent slopes	5,920	1.6
Ardilla sandy loam, 0 to 2 percent slopes	26,674	7.0
Bibb and Osier soils, frequently flooded	24,113	6.6
Bigbee-Kalmia-Eunola association	12,580	3.4
Bonifay loamy sand, 0 to 5 percent slopes	10,663	3.0
Byars soils, ponded	2,253	.6
Chastain and Bibb soils	4,317	1.2
Dothan sandy loam, 0 to 2 percent slopes	12,910	3.5
Dothan sandy loam, 2 to 5 percent slopes	83,676	22.6
Dothan sandy loam, 5 to 8 percent slopes	16,013	4.3
Esto loamy sand, 2 to 5 percent slopes	2,160	.6
Esto loamy sand, 5 to 12 percent slopes	12,452	3.4
Eunola sandy loam	5,985	1.6
Fuquay loamy sand, 1 to 5 percent slopes	12,573	3.4
Grady silt loam	4,711	1.3
Kalmia loamy sand, 0 to 3 percent slopes	7,326	2.0
Leaf-Lenoir complex	4,810	1.3
Lucy loamy sand, 0 to 5 percent slopes	5,955	1.6
Orangeburg sandy loam, 0 to 2 percent slopes	7,030	1.9
Orangeburg sandy loam, 2 to 5 percent slopes	29,970	8.1
Orangeburg sandy loam, 5 to 8 percent slopes	14,750	4.0
Plummer loamy sand	4,070	1.1
Rains sandy loam	8,510	2.3
Red Bay sandy loam, 0 to 2 percent slopes	391	.1
Red Bay sandy loam, 2 to 5 percent slopes	5,535	1.5
Red Bay sandy loam, 5 to 8 percent slopes	5,855	1.6
Red Bay loamy sand, 8 to 12 percent slopes	1,281	.3
Troup loamy sand, 0 to 5 percent slopes	5,885	1.6
Troup loamy sand, 5 to 12 percent slopes	19,499	5.3
Total	369,920	100.0

[1] Italic numbers in parentheses refer to Literature Cited, p. 57.

the acreage has been cleared and is now used for row crops, pasture, and hay.

Representative profile of Alaga loamy sand, 0 to 5 percent slopes, 2.25 miles north of Geneva in the NE¼SE¼SW¼ sec. 8, T. 1 N., R. 22 E.

Ap—0 to 8 inches, very dark grayish-brown (10YR 3/2) loamy sand; single grained and very weak, fine, granular structure; very friable; few fine roots; strongly acid; clear, smooth boundary.

C1—8 to 45 inches, light yellowish-brown (10YR 6/4) loamy sand that has common, fine, distinct mottles (clean sand) of very pale brown (10YR 7/3); single grained; very friable; strongly acid; gradual, diffuse boundary.

C2—45 to 80 inches, very pale brown (10YR 7/3) sand that has common, medium, faint pockets of light yellowish brown (10YR 6/4); single grained; loose; strongly acid.

The Ap horizon is very dark grayish brown, dark grayish brown, or grayish brown. The C1 horizon ranges from light yellowish brown to yellowish brown, brown, or reddish yellow. Clean, very pale brown to white sand grains are common. The C2 horizon ranges from very pale brown to light yellowish-brown sand or loamy sand. Yellowish-brown to white mottles are common. Reaction is strongly acid to very strongly acid in the upper 45 inches and strongly acid below that depth.

Alaga soils are adjacent to, and sandier throughout than, Bonifay, Lucy, and Troup soils. Alaga soils do not have the plinthite that is common in Bonifay and Fuquay soils.

Alaga loamy sand, 0 to 5 percent slopes (AaB).—This soil has the profile described as representative of the series. Included in mapping are areas of soils that have a sand surface and small areas of soils that have slopes of more than 5 percent. Also included were a few small areas of Bonifay and Troup soils.

Peanuts, corn, tomatoes, bahiagrass, and Coastal bermudagrass are the main field and pasture crops grown on this soil. Such drought-resistant crops as Coastal bermudagrass and bahiagrass are better suited than cultivated row crops. Response to lime and fertilizer is moderate. Leaching of plant nutrients is a concern, and split applications of fertilizer are generally beneficial. When this soil is used for cultivated crops, management practices are needed to prevent concentration of runoff. Contour farming, minimum tillage, and crop residue management are effective in controlling erosion, but terraces are not suitable on this soil.

This soil is suited to needleleaf trees. Soil-related management concerns are moderate seedling mortality and slight to moderate equipment restrictions. Species suitable for planting are loblolly pine, slash pine, and longleaf pine. Capability unit IIIs-14; woodland suitability group 3s2.

Alpin Series

The Alpin series consists of deep, excessively drained soils on stream terraces. These soils have slopes of 0 to 3 percent. They formed in old, stream-deposited sediment. Elevations range from 100 to 140 feet.

In a representative profile the surface layer is 17 inches of dark-brown and brown sand. The subsurface layer is 31 inches of brownish-yellow sand. Below this, to a depth of 64 inches, is 16 inches of brownish-yellow and white sand that contains few to common lamellae. The next layer is 20 inches of yellow and white sand that has a few discontinuous, yellowish-brown lamellae.

Alpin soils have very low available water capacity. Permeability is very rapid throughout. Organic-matter content and natural fertility are very low. The native vegetation was a moderate stand of low-grade hardwoods and a few pines. Some of the acreage has been cleared and cultivated, but most of this is now used for pasture or is idle.

Representative profile of Alpin sand, 0 to 3 percent slopes, 3 miles southwest of Samson in the NW¼SE¼SE¼ sec. 6, T. 1 N., R. 20 E., in woods:

A11— 0 to 6 inches, dark-brown (10YR 3/3) sand; weak, fine, granular structure; loose; common fine roots; strongly acid; clear, smooth boundary.

A12—6 to 17 inches, brown (10YR 4/3) sand; single grained; loose; few fine and medium roots; strongly acid; clear, wavy boundary.

A21—17 to 48 inches, brownish-yellow (10YR 6/6) sand; single grained; loose; vertical streaks of clean sand grains; strongly acid; gradual, wavy boundary.

A2&B11—48 to 56 inches, brownish-yellow (10YR 6/6) and white (10YR 8/1) sand; single grained; loose; few, very thin, discontinuous, yellowish-brown (10YR 5/6) lamellae; sand grains in lamellae are coated and weakly bridged with clay; strongly acid; clear, wavy boundary.

A2&B12—56 to 64 inches, brownish-yellow (10YR 6/6) and white (10YR 8/1) sand; single grained; loose; common, discontinuous, yellowish-brown (10YR 5/6) lamellae; sand grains in lamellae are coated and weakly bridged with clay; strongly acid; clear, wavy boundary.

A2&B13—64 to 84 inches, yellow (10YR 7/6) and white (10YR 8/1) sand; single grained; loose; few vertical streaks of uncoated sand; few, discontinuous, yellowish-brown (10YR 5/6) lamellae, 1 millimeter thick; strongly acid; clear, wavy boundary.

The A11 horizon is very dark grayish brown, dark grayish brown, dark brown, brown, or dark yellowish brown. The A12 horizon is brown, yellowish brown, light yellowish brown, or brownish yellow. The A21 horizon is brownish yellow, very pale brown, or yellow. There are a few pockets or streaks of white (10YR 8/1) or light-gray (10YR 7/2) clean sand grains. The A2 part of the B11, B12, and B13 horizon is light gray, white, or very pale brown. The B part of these horizons is light yellowish-brown, yellowish-brown, brownish-yellow, or yellow sand, loamy sand, or sandy loam lamellae ranging from 1 to 5 millimeters in thickness. Total thickness of the lamellae is 1 inch to 3 inches. Reaction is strongly acid throughout.

Alpin soils are adjacent to Bigbee, Eunolo, Kalmia, Leaf, and Lenoir soils. Alpin soils are sandier throughout and have better drainage than all of these soils except Bigbee soils. They have lamellae, and Bigbee soils do not.

Alpin sand, 0 to 3 percent slopes (ApA).—This soil has the profile described as representative of the series. Included in mapping are soils that have a loamy sand surface layer and soils that do not have lamellae within 80 inches of the surface. Also included are areas of Eunola, Kalmia, Leaf, and Lenoir soils.

Most areas of this soil are used for woodland. The soil is too droughty for cultivated row crops. Coastal bermudagrass and bahiagrass are suitable for pasture. Response to lime and fertilizer is moderate to low.

This soil is suited to needleleaf trees. Soil-related management concerns include severe seedling mortality. Species suitable for planting are loblolly pine and slash pine. Capability unit IVs–14; woodland suitability group 3s2.

Ardilla Series

The Ardilla series consists of deep, somewhat poorly drained soils on uplands. These soils have slopes of 0 to 2 percent. They formed in Coastal Plain marine deposits of unconsolidated sandy clay loam or sandy loam. Elevations range from about 150 to 250 feet.

In a representative profile the surface layer is very dark gray sandy loam 6 inches thick. The subsurface layer is brown sandy loam 5 inches thick. The subsoil is 59 inches thick. The upper 9 inches is light yellowish-brown sandy loam; the next 18 inches is firm, brittle, light yellowish-brown sandy clay loam that is mottled with light gray and that is 8 percent plinthite; the next 12 inches is light-gray sandy clay loam mottled with light yellowish brown and strong brown; and the lower 20 inches is mottled strong-brown, light-gray, and red sandy clay loam.

Ardilla soils have low or moderate available water capacity. Infiltration of water is moderately rapid. Permeability is moderate in the upper part of the subsoil and moderately slow in the lower part. The seasonal high water table is within 15 inches of the surface for 1 to 3 months, mainly in March and April. Organic-matter content and natural fertility are low. The native vegetation was a moderately dense stand of mixed hardwoods and pines. Nearly all the acreage of these soils has been cleared and is now used for row crops and pasture.

Representative profile of Ardilla sandy loam, 0 to 2 percent slopes, 6 miles west of Geneva in the SW¼ NW¼SW¼ sec. 16, T. 1 N., R. 21 E., in pasture:

Ap—0 to 6 inches, very dark gray (10YR 3/1) sandy loam; weak, fine, granular structure; very friable; many fine roots; strongly acid; abrupt, smooth boundary.

A2—6 to 11 inches, brown (10YR 5/3) sandy loam; weak, fine, granular structure; very friable; few fine roots; strongly acid; clear, smooth boundary.

B1—11 to 20 inches, light yellowish-brown (10YR 6/4) sandy loam; weak, medium, subangular blocky structure; friable; sand grains coated and bridged with clay; strongly acid; gradual, wavy boundary.

B21t—20 to 38 inches, light yellowish-brown (10YR 6/4) sandy clay loam; common, medium, distinct mottles of light gray; moderate, medium, subangular blocky structure parting to very weak platy in places; about 40 to 50 percent of peds are firm and brittle; few to common small pores; thin patchy clay films on faces of peds and in pores; 8 percent red and strong-brown plinthite; strongly acid; gradual, wavy boundary.

B22t—38 to 50 inches, light-gray (10YR 7/2) sandy clay loam; common, medium, distinct mottles of light yellowish brown and strong brown; moderate, medium, subangular blocky structure; thin patchy clay films on faces of peds; friable; 2 percent plinthite; strongly acid; gradual, wavy boundary.

B23t—50 to 70 inches, mottled strong-brown (7.5YR 5/8), light-gray (10YR 7/2), and red (2.5YR 4/6) sandy clay loam; weak, medium, subangular structure; friable to firm; strongly acid.

The Ap horizon is black, very gray, or dark grayish brown. The A2 horizon is dark grayish brown, grayish brown, light brownish gray, brown, or light yellowish brown. The B1 horizon is yellowish brown, light olive brown, light yellowish brown, or brownish yellow. The B21t horizon is light olive brown, light yellowish brown, yellowish brown, very pale brown, or light gray and is mottled in many places in shades of brown, yellow, red, and gray. The B22t and B23t horizons range from sandy clay loam to sandy clay below a depth of 37 inches. These horizons are mottled in various shades of yellow, brown, red, and gray. Depth to the horizon that is 5 to 25 percent plinthite ranges from 20 to 38 inches. Reaction is strongly acid throughout.

Alpin soils are adjacent to Bigbee, Eunola, Kalmia, Leaf, Grady, and Rains soils. Ardilla soils are not so well drained as Dothan and Fuquay soils, but they are better drained than Byars, Grady, and Rains soils. Ardilla soils do not have a thick A horizon, and Fuquay soils do. Also, they contain plinthite, and Grady and Rains soils do not.

Ardilla sandy loam, 0 to 2 percent slopes (ArA).—This soil has the profile described as representative of the series. Included in mapping are soils that have a loamy sand or loam surface layer, soils that have a surface layer more than 10 inches thick, and soils where the upper part of the layer with clay accumulation is sandy loam. Soils that are loamy sand throughout are included. These soils are 6 to 7 miles south-southeast of Samson. Also included are a few small areas of Dothan, Fuquay, Grady, and Rains soils.

Corn, soybeans, bahiagrass, Coastal bermudagrass, and fescue grass pasture (fig. 2) are the most commonly grown crops. Response to lime and fertilizer is good. Cultivated row crops can be grown each year when good management practices are used. Shallow field ditches can be installed to improve drainage in some fields. Crop residues should be returned to the soil to help maintain organic-matter content. Tillage operations generally are delayed in spring because of wetness.

This soil has high potential productivity and is suited to broadleaf and needleleaf trees. It has moderate equipment restrictions and slight to moderate seedling mortality. Species suitable for planting are slash pine, loblolly pine, sycamore, sweetgum, yellow-poplar, and cottonwood. Capability unit IIw–12; woodland suitability group 2w8.

Bibb Series

The Bibb series consists of deep, poorly drained, alluvial soils along streams and drainageways. These soils have slopes of 0 to 2 percent. They formed in material washed from surrounding uplands. Elevations range from about 70 to 200 feet.

In a representative profile the surface layer is dark-gray silt loam 8 inches thick. The underlying material extends to a depth of 65 inches. The upper 17 inches is dark-gray sandy loam that has strata of light-gray silt loam to loamy sand. The next 10 inches is dark-gray loam that has strata of brownish-yellow and strong-brown silt loam to loamy sand. The next 11 inches is gray sandy loam. Below this is gray sandy loam mottled with light brownish gray to a depth of 60 inches and yellowish-brown sand that has splotches of yellowish red to a depth of 65 inches.

Bibb soils have moderate available water capacity and moderate permeability. The seasonal high water table is within 10 inches of the surface for more than 6 months of the year. The soils are subject to very frequent flooding throughout the year. Organic-matter content and natural fertility are low. The native vegetation was a dense stand of mixed hardwoods. Only a

Figure 2.—Fescue pasture on Ardilla sandy loam, 0 to 2 percent slopes.

small acreage of these soils has been cleared, and it is used for pasture.

Representative profile of Bibb silt loam in an area of Bibb and Osier soils, frequently flooded, 5 miles south of Slocomb in the NE¼SE¼NE¼ sec. 30, T. 1 N., R. 2 E., in woods:

A1—0 to 8 inches, dark-gray (N 4/0) silt loam; weak, fine, granular structure; very friable; common fine and medium roots; strongly acid; clear, smooth boundary.

C1—8 to 25 inches, dark-gray (10YR 4/1) sandy loam that has a few fine strata of light-gray silt loam to loamy sand; massive; slightly sticky; few fine and medium roots; very strongly acid; gradual, smooth boundary.

C2—25 to 35 inches, dark-gray (10YR 4/1) loam that has common thin strata of brownish-yellow and strong-brown silt loam to loamy sand; massive; sticky; few fine and medium roots; strongly acid; gradual, smooth boundary.

C3—35 to 46 inches, gray (10YR 5/1) sandy loam; massive; slightly sticky; few fine roots; very strongly acid; gradual, smooth boundary.

C4—46 to 60 inches, gray (10YR 5/1) sandy loam that has common, medium, distinct mottles of light brownish gray; massive; slightly sticky; few fine decomposed roots; very strongly acid; abrupt, smooth boundary.

C5—60 to 65 inches, yellowish-brown (10YR 5/6) sand that has splotches of yellowish red; single grained; loose; strongly acid.

The A horizon is black, very dark grayish-brown, dark-gray, or dark-brown silt loam, loam, sandy loam, or loamy sand. Mottles in shades of yellow or brown are common. The C horizon is very dark gray, dark gray, or light gray, and mottles in shades of yellow, brown, and red are common. The C horizon, to a depth of 60 inches, is stratified sandy loam, loam, silt loam, and loamy sand. Reaction ranges from strongly to very strongly acid throughout.

Bibb soils are adjacent to Chastain, Grady, Leaf, Lenoir, Osier, and Plummer soils. Bibb soils contain less clay throughout and have a less well defined profile than all these soils except Osier soils. They contain more clay throughout than Osier soils. Bibb soils do not have a thick sandy A horizon, and Plummer soils do.

Bibb and Osier soils, frequently flooded (Bb).—This mapping unit consists of deep, poorly drained soils along streams and drainageways throughout the county. The soils do not occur in a uniform pattern; both soils are in some mapped areas, and only one is in others. Slopes range from 0 to 2 percent.

The composition of this unit is more variable than that of most others in the county, but mapping has been controlled well enough that reliable interpretations can be made for the purposes for which the soils likely can be used.

Bibb soils make up about 50 percent of mapped areas and Osier soils, about 30 percent. The remaining 20 percent is made up of various soils that are similar to Bibb or Osier soils in use and management. Included with these soils in mapping are small areas of Ardilla, Plummer, and Rains soils.

This is the only mapping unit in which these soils are mapped in this county. For a description of the Osier soils in this unit, see the Osier series.

Most areas of this mapping unit are used for woodland. Bahiagrass and tall fescue can be successfully grown in most areas. Field ditches can be installed in some areas that have adequate outlets. Drainage improves the suitability for pasture crops, and in some areas it is possible to grow some of the more water-tolerant cultivated crops. Competition from native weedy plants is generally severe in pasture. Response to lime and fertilizer is good.

This mapping unit is suited to broadleaf or needleleaf trees if drainage is adequate. Soil-related management concerns are severe equipment restrictions and seedling mortality, except in areas of adequately drained soils. Species suitable for planting are loblolly pine, slash pine, sycamore, and cottonwood. Capability unit Vw–13; woodland suitability group 2w9.

Bigbee Series

The Bigbee series consists of deep, excessively drained soils on low stream terraces, dominantly along the Pea River and the Choctawhatchee River. These soils have slopes of 0 to 3 percent. They formed in old stream-deposited sediment. Elevations range from 80 to 110 feet.

In a representative profile the surface layer is 8 inches of dark yellowish-brown loamy sand. The underlying material extends to a depth of 80 inches. It is 26 inches of yellowish-brown loamy sand and sand over 46 inches of very pale brown sand mottled with yellowish brown and dark yellowish brown.

Bigbee soils have very low available water capacity. Permeability is rapid throughout. The seasonal high water table fluctuates with the water level of the rivers. Organic-matter content and natural fertility are very low. The native vegetation was a moderate stand of low grade hardwoods and a few pines. All of the acreage of this soil is in forest.

Representative profile of Bigbee loamy sand in an area of Bigbee-Kalmia-Eunola association, 8 miles south-southeast of Samson in the NE¼SW¼ sec. 24, T. 7 N., R. 18 W., in woods:

Ap—0 to 8 inches, dark yellowish-brown (10YR 4/4) loamy sand; weak, fine, granular structure; very friable; strongly acid; abrupt, smooth boundary.

C1—8 to 15 inches, yellowish-brown (10YR 5/6) loamy sand; single grained; very friable; strongly acid; clear, smooth boundary.

C2—15 to 34 inches, yellowish-brown (10YR 5/4) sand; few streaks of clean sand grains; single grained; loose; strongly acid; clear, smooth boundary.

C3—34 to 80 inches, very pale brown (10YR 7/3) sand that has a few, fine to medium, distinct, yellowish-brown and dark yellowish-brown mottles; single grained; loose; strongly acid.

The Ap horizon is dark-brown, brown, dark yellowish-brown, or dark grayish-brown loamy sand or sand. The upper 25 to 50 inches of the C horizon is yellowish-brown, light yellowish-brown, and very pale brown loamy sand, loamy fine sand, or sand. Below a depth of 50 inches, the C horizon is pale brown, light yellowish brown, very pale brown, or yellow. Yellow, brown, or red mottles are few to common. Reaction ranges from strongly acid to very strongly acid throughout.

Bigbee soils are adjacent to Alpin, Eunola, Kalmia and Lenoir soils. Bigbee soils do not have lamellae, and Alpin soils do. They are coarser textured throughout than Eunola, Kalmia, and Lenoir soils.

Bigbee-Kalmia-Eunola association (BK).—This mapping unit consists of deep, nearly level, excessively drained to moderately well drained sandy and loamy soils on stream terraces. Mapped areas are generally 10 to 20 feet above the normal stream level and are subject to occasional, short-duration flooding late in winter and early in spring. Areas are wooded and 300 to 5,000 feet wide. Slopes range from 0 to 3 percent.

The composition of this unit is more variable than that of most others in the county, but mapping has been controlled well enough that reliable interpretations can be made for the purposes for which the soils likely can be used.

This mapping unit is about 25 percent Bigbee soils, 23 percent Kalmia soils, 20 percent Eunola soils, and 32 percent mainly poorly drained soils.

The poorly drained soils are at the lowest elevations or in sloughs that run throughout the area. Bigbee soils are at the highest elevations, generally on natural stream levees adjacent to streams. This is the only mapping unit in which the Bigbee soils are mapped in this county. Kalmia soils are at lower elevations than Bigbee soils. They have a profile similar to the one described as representative of their series, but the surface layer generally is finer textured and the subsoil is 3 to 5 inches thicker. Eunola soils are at lower elevations than Kalmia soils. They have profiles similar to the ones described as representative of their series, but the surface layer is slightly finer textured and the subsoil is 4 to 6 inches thicker. For descriptions of the Kalmia and Eunola soils in this unit, see the Kalmia and Eunola series, respectively.

These soils are suited to needleleaf and broadleaf trees. They have slight to moderate equipment restrictions and slight to severe seedling mortality. Species suitable for planting are slash pine, loblolly pine, yellow poplar, cottonwood, sweetgum, and sycamore.

All of the acreage of these soils is in forest. The soils are better suited to trees than to other uses. The soils are poorly suited to row crops because of the hazard of flooding. Some areas are suited to adapted grasses and legumes for pasture. The soils are well suited to habitat for game animals, especially squirrel and deer. Bigbee soils in capability unit IIIs–14; woodland suitability group 2s2. Kalmia soils in capability unit I–16; woodland suitability group 2o7. Eunola soils in capability unit IIw–15; woodland suitability group 2w8.

Bonifay Series

The Bonifay series consists of deep, well-drained soils on uplands. These soils have slopes of 0 to 5 percent. They formed in marine deposits of unconsolidated loamy sand to sandy clay loam. Elevations range from 100 to 200 feet.

In a representative profile the surface layer is very dark grayish-brown loamy sand 6 inches thick. The subsurface layer is 50 inches thick. It is brownish-yellow loamy sand to a depth of 22 inches, light yellowish-brown loamy sand mottled with yellowish brown to a depth of 42 inches, and mottled light-gray and pale-brown sand to a depth of 56 inches. The subsoil is mottled yellowish-brown, pale-brown, strong-brown, and

Figure 3.—**Corn growing on Bonifay loamy sand, 0 to 5 percent slopes.**

yellowish-red sandy clay loam, is 10 percent plinthite, and is 14 inches thick.

Bonifay soils have low available water capacity. Permeability is rapid in the surface layer and moderate in the subsoil. Organic-matter content and natural fertility are low. The native vegetation was chiefly low-quality hardwoods and some pines. Most of the acreage has been cleared and is now used for pasture, hay, and row crops.

Representative profile of Bonifay loamy sand, 0 to 5 percent slopes, 7 miles west of Geneva in the NE¼ NE¼NW¼ sec. 18, T. 1 N., R. 21 E., in a pine plantation:

Ap—0 to 6 inches, very dark grayish-brown (10YR 3/2) loamy sand; single grained; loose; common fine and medium roots; strongly acid; abrupt, smooth boundary.

A21—6 to 22 inches, brownish-yellow (10YR 6/6) loamy sand; single grained; loose; common medium roots; strongly acid; clear, smooth boundary.

A22—22 to 42 inches, light yellowish-brown (10YR 6/4) loamy sand that has common, medium, distinct mottles of yellowish brown; single grained; loose; 20 percent clean sand grains; strongly acid; gradual, irregular boundary.

A23—42 to 56 inches, mottled light-gray (10YR 7/1) and pale-brown (10YR 6/3) sand; single grained; loose; 50 percent clean sand grains; very strongly acid; clear, smooth boundary.

B2t—56 to 70 inches, mottled yellowish-brown (10YR 5/6), pale-brown (10YR 6/3), strong-brown (7.5YR 5/6), and yellowish-red (5YR 5/6) sandy clay loam; weak, fine, subangular blocky structure; friable; thin distcontinuous clay films on faces of peds; 10 percent soft plinthite; very strongly acid.

The Ap horizon is very dark grayish brown, dark grayish brown, brown, or grayish brown. The A2 horizon is yellowish-brown, pale-brown, light yellowish-brown, and brownish-yellow loamy sand or sand. Pockets or bodies of light-gray or white, clean sand are common below a depth of 30 inches. The Bt horizon is at a depth of 40 to 70 inches. It is yellowish brown or brownish yellow and mottled with light gray, pale brown, yellow, and red. The Bt horizon ranges from sandy clay loam to sandy loam and is 5 to 25 percent plinthite. Reaction is strongly acid or very strongly acid throughout the profile.

Bonifay soils are adjacent to Alaga, Fuquay, Lucy, and Troup soils. Bonifay soils are not so sandy throughout as Alaga soils. They have a thicker sandy A horizon than Fuquay and Lucy soils. Bonifay soil contains plinthite in the B horizon, and Troup soils do not.

Bonifay loamy sand, 0 to 5 percent slopes (BoB).—This soil has the profile described as representative of the series. Included in mapping are a few small areas of Alaga, Fuquay, Lucy, Orangeburg, and Troup soils and soils that have slopes of more than 5 percent.

Corn (fig. 3), soybeans, peanuts, bahiagrass, and Coastal bermudagrass are the main field and pasture crops grown on this soil. Drought-tolerant crops such as Coastal bermudagrass and bahiagrass are better suited than cultivated row crops. Response to lime and fertilizer is moderate. Leaching of plant nutrients is a concern, and split applications of fertilizer are generally beneficial. Contour farming, minimum tillage, and crop residue management are effective in controlling erosion on cultivated fields. Crop residue should be returned to the soil to help maintain organic-matter content.

This soil is better suited to needleleaf trees than to most other uses. Soil-related management concerns are moderate seedling mortality and slight to moderate equipment restrictions. Species suitable for planting are slash pine, loblolly pine, and longleaf pine. Capability unit IIIs–14; woodland suitability group 3s2.

Byars Series

The Byars series consists of deep, very poorly drained soils at the heads of drainageways and in depressions on uplands. These soils have slopes of 0 to 2 percent. They formed in clayey marine deposit. Elevations range from 200 to 250 feet.

In a representative profile the surface layer is 15 inches of very dark gray silt loam that is mottled with light gray in the lower 5 inches. The subsoil is light-gray clay 50 inches thick and is mottled with brownish yellow in the lower part.

Byars soils have moderate or high available water capacity. Permeability is slow. These soils are mainly ponded to a depth of 3 feet throughout the year, but they are sometimes dry for 1 to 3 months during periods of low rainfall, from August to November. Organic-matter content is moderate, and natural fertility is low. The native vegetation was a moderate stand of blackgums, sweetgums, tupelo gums, cypress, and water oaks. None of the acreage of these soils has been cleared.

Representative profile of Byars silt loam in an area of Byars soils, ponded, 1.5 miles south of Hacoda in the SE¼NW¼SE¼ sec. 17, T. 1 N., R. 19 E., in woods:

A11—0 to 10 inches, very dark gray (10YR 3/1) silt loam; moderate, medium, granular structure parting to weak, fine, subangular blocky; slightly sticky; very strongly acid; clear, smooth boundary.

A12—10 to 15 inches, very dark gray (10YR 3/1) silt loam that has few, fine, distinct mottles of light gray (10YR 7/2); moderate, medium, granular structure parting to weak, fine, subangular blocky; slightly sticky; very strongly acid; clear, smooth boundary.

B21tg—15 to 50 inches, light-gray (10YR 6/1) clay; moderate, medium, subangular blocky structure; plastic; very strongly acid; gradual, smooth boundary.

B22tg—50 to 65 inches, light-gray (10YR 6/1) clay that has few, fine, distinct mottles of brownish yellow (10YR 6/6); moderate, medium, subangular blocky structure; plastic; very strongly acid.

The A horizon is black or very dark gray. The B2t horizon is gray or light-gray clay, silty clay, or clay loam that has few to common brown, yellow, and gray mottles. Reaction is strongly acid or very strongly acid throughout.

Byars soils are adjacent to Ardilla, Grady, Plummer, and Rains soils. Byars soils are more poorly drained than any of these soils except Grady soils. They do not have plinthite that Ardilla soils have, they have a darker colored A horizon than Grady soils, they do not have the thick sandy A horizon that Plummer soils have, and they have a higher content of clay in the B horizon than Rains soils.

Byars soils, ponded (By).—This nearly level soil has mainly concave slopes. It has the profile described as representative of the series.

Included with this soil in mapping are a few small areas of Ardilla, Grady, and Rains soils and soils that have a loam, sandy loam, or silty clay loam surface layer.

This soil is better suited to broadleaf trees than to most other uses. It has severe equipment restrictions and seedling mortality. Species suitable for planting are water tupelo and sweetgum.

This soil is in a mixed hardwood forest of cypress and gum. It is poorly suited to row crops, pasture, or homesites because of wetness and ponding. It is suited to habitat for game animals, especially waterfowl, beaver, and muskrat. Capability unit VIIw–11; woodland suitability group 4w3.

Chastain Series

The Chastain series consists of deep, poorly drained, nearly level soils on flood plains. These soils have slopes of 0 to 2 percent. They formed in fine-textured alluvial sediment. Elevations range from 90 to 110 feet.

In a representative profile the surface layer is 8 inches of mottled dark yellowish-brown and light-gray silty clay loam. The upper 28 inches of the subsoil is gray silty clay loam mottled with yellowish red and red, and the lower 29 inches is gray loam mottled with light yellowish brown.

Chastain soils have moderate or high available water capacity and slow permeability. Flooding is frequent in winter and spring, and the soil is ponded or the water table is within 10 inches of the surface for 6 months of the year. Organic-matter content and natural fertility are low. The native vegetation was a dense stand of blackgum, sweetgum, ash, water oak, and cypress. None of the acreage of these soils has been cleared.

Representative profile of Chastain silty clay loam in an area of Chastain and Bibb soils, 6.5 miles northeast of Geneva in the SW¼NE¼NW¼ sec. 26, T. 2 N., R. 22 E., in woods:

A—0 to 8 inches, mottled dark yellowish-brown (10YR 4/4) and light-gray (10YR 7/1) silty clay loam; weak, fine, subangular blocky structure; slightly sticky; strongly acid; clear, smooth boundary.

B21g—8 to 15 inches, gray (10YR 6/1) silty clay loam that has a few distinct mottles of yellowish red (5YR 5/8) and common, medium, distinct mottles of red (2.5YR 4/6); weak, fine, subangular blocky structure; slightly sticky; strongly acid; clear, smooth boundary.

B22g—15 to 36 inches, gray (10YR 6/1) silty clay loam that has common, medium, distinct mottles of yellowish red (5YR 5/8); moderate, medium,

subangular blocky structure; slightly plastic; very strongly acid; clear, smooth boundary.

B3g—36 to 65 inches, gray (N 5/0) loam that has a few, fine, faint mottles of light yellowish brown (2.5Y 6/4); moderate, medium, subangular blocky structure; plastic; very strongly acid.

The A horizon is very dark grayish brown, dark brown, dark yellowish brown, gray, or light gray or, in places, is mottled with these colors. It is silt loam or silty clay loam. The B2g horizon is olive-gray, dark-gray, or gray silty clay loam, silty clay, or clay loam that has few to common yellowish-red, red, or brown mottles. The B3g horizon is gray or light-gray loam, sitly clay loam, or silty clay. Yellow, brown, or red mottles are few to common. Reaction is strongly acid or very strongly acid throughout.

Chastain soils are adjacent to Bibb, Bigbee, Leaf, Lenoir, and Osier soils. Chastain soils have more clay throughout than Bibb, Bigbee, and Osier soils and are much more poorly drained than Bigbee soils. They have a less well defined profile than Leaf and Lenoir soils and are more poorly drained than Lenoir soils.

Chastain and Bibb soils (CB).—This mapping unit consists of deep, poorly drained soils. The soils do not occur in a uniform pattern; both soils are in some mapped areas, and only one is in others. Slopes range from 0 to 2 percent. These soils are flooded frequently, and water remains on low ridges and sloughs for several months during the year.

The composition of this unit is more variable than that of most others in the county, but mapping has been controlled well enough that reliable interpretations can be made for the purposes for which the soils likely can be used.

Chastain soils make up about 45 percent of mapped areas and Bibb and similar soils, about 25 percent. The remaining 30 percent is made up of Bigbee, Eunola, and Kalmia soils. The Chastain soil is at the lowest elevations, and the Bibb soil is at low to intermediate elevations. Bigbee soils are on natural levees and at higher elevations with Eunola and Kalmia soils.

This is the only mapping unit in which the Chastain soil is mapped in this county. The Bibb soil has a profile similar to the one described as representative of the Bibb series, but it is siltier throughout and generally is lighter gray. For a description of the Bibb soils in this unit, see the Bibb series.

These soils are suited to needleleaf and broadleaf trees. They have severe equipment restrictions and moderate seedling mortality. Most of the acreage is in hardwoods, but where pine grows, its growth is rapid. Species suitable for planting are slash pine, loblolly pine, and sweetgum. In adequately drained areas, sycamore and cottonwood can be planted.

All of the acreage of this mapping unit is in mixed gum, cypress, and oaks. It is poorly suited to row crops, pasture, homesites, or recreational areas because of wetness and the hazard of flooding. It is suited to game animals, especially waterfowl, beaver, and muskrat. Capability unit Vw–13; woodland suitability group 2w9.

Dothan Series

The Dothan series consists of deep, well drained or moderately well drained soils on uplands. These soils have slopes of 0 to 8 percent. They formed in marine deposits of unconsolidated sandy clay loam. Elevations range from 200 to 300 feet.

In a representative profile the surface layer is 6 inches of brown sandy loam. The subsoil is yellowish-brown sandy clay loam to a depth of 65 inches. The lower 39 inches is mottled with strong brown, pale brown, and red and is 15 percent plinthite.

Dothan soils have moderate available water capacity. Permeability is moderate in the upper part of the subsoil and moderately slow in the lower part. The seasonal high water table is within 30 inches of the surface 2 to 3 months of the year from January to April. Organic-matter content and natural fertility are low. The native vegetation was a moderately dense stand of mixed hardwood and pine forest. Nearly all of the acreage has been cleared and is used for row crops, pasture (fig. 4), and hay.

Representative profile of Dothan sandy loam, 2 to 5 percent slopes, 6.5 miles east-northeast of Geneva in the NW¼SE¼ sec. 8, T. 1 N., R. 23 E., in a field:

Ap—0 to 6 inches, brown (10YR 4/3) sandy loam; weak, fine, granular structure; common fine roots; very friable; strongly acid; clear, smooth boundary.

B21t—6 to 21 inches, yellowish-brown (10YR 5/8) sandy clay loam; weak, medium, subangular blocky structure; friable; thin patchy clay films on faces of peds; strongly acid; gradual, smooth boundary.

B22t—21 to 26 inches, yellowish-brown (10YR 5/6) sandy clay loam; weak, medium, subangular blocky structure; friable; thin clay films on faces of peds and in pores; 3 percent soft plinthite; strongly acid; gradual, smooth boundary.

B23t—26 to 65 inches, yellowish-brown (10YR 5/8) sandy clay loam that has common, medium, distinct mottles of strong brown (7.5YR 5/6), red (10R 4/8), and pale brown (10YR 6/3); moderate, medium, subangular blocky structure; firm; clay films on faces of peds and in pores; 15 percent plinthite; strongly acid.

The Ap horizon ranges from dark grayish brown to brown and grayish brown. The B1 horizon, where present, is yellowish-brown or light yellowish-brown sandy loam or sandy clay loam. The B2t horizon is yellowish brown, brownish yellow, or strong brown. The lower part has a few yellow, brown, or red mottles and is sandy loam, sandy clay loam, or sandy clay. Depth to the horizon that is 5 to 25 percent plinthite ranges from 24 to 50 inches. Iron concretions are less than 5 percent of the Ap, B21t, and B22t horizons. Reaction is strongly acid or very strongly acid throughout.

Dothan soils are adjacent to Ardilla, Esto, Fuquay, and Orangeburg soils. Dothan soils are better drained and do not have the firm and brittle layer in the B horizon as do Ardilla soils. They have less clay in the B horizon than Esto soils. Dothan soils do not have the thick, sandy A horizon of the Fuquay soils, and the B horizon is not so red as the B horizon in Orangeburg soils. Dothan soils have plinthite in the B horizon, and Esto and Orangeburg soils do not.

Dothan sandy loam, 0 to 2 percent slopes (DoA).—This soil is on broad ridgetops. The profile of this soil is similar to the one described as representative of the series, but the surface layer is sandier and the layer that has plinthite is 5 to 10 inches deeper.

Included with this soil in mapping are soils that have a loamy sand surface layer and soils that have a dark-brown or dark yellowish-brown surface layer. Soils that are sandy loam to a depth of 30 inches and some small areas of soils where the surface layer and upper part of the subsoil are more than 5 percent iron concre-

Figure 4.—**Arrowleaf clover growing on Dothan sandy loam, 2 to 5 percent slopes. This crop is used for pasture and seed production.**

tions are included. Also included are soils that have slopes of more than 2 percent and a few small areas of Ardilla, Esto, Fuquay, and Orangeburg soils.

This soil is suited to all crops commonly grown in the county. Corn, peanuts, small grain, soybeans, grain sorghum, truck crops, bahiagrass, and Coastal bermudagrass are the main crops. Cultivated crops can be grown each year when good management practices are used. Crop residues should be returned to the soil to help maintain organic-matter content. The hazard of erosion is slight.

This soil is better suited to needleleaf trees than to most other uses. There are no soil-related management concerns. Species suitable for planting are slash pine, loblolly pine, and longleaf pine. Capability unit IIs–12; woodland suitability group 2o1.

Dothan sandy loam, 2 to 5 percent slopes (DoB).—This soil is on broad ridgetops and narrow side slopes. It has the profile described as representative for the series.

Included with this soil in mapping are areas of soils that have a surface layer of loamy sand, some small areas of soils where the upper part of the subsoil is sandy loam, and soils where the surface layer and upper part of the subsoil are more than 5 percent iron concretions. Soils that have slopes of less than 2 percent and soils that have slopes of more than 5 percent are included. Also included are a few small areas of Ardilla, Esto, Fuquay, and Orangeburg soils.

This soil is well suited to all crops commonly grown in the county. Corn, peanuts, truck crops (fig. 5), small grain (fig. 6), soybeans, grain sorghum, bahiagrass, Coastal bermudagrass, and adapted clovers are the main crops. Such effective erosion-control practices as contour farming, grassed waterways, contour stripcropping, terraces, and minimum tillage are needed on cultivated fields. Cropping systems should use a close-growing crop such as small grain 1 year out 2. Crop residues should be returned to the soil to help maintain organic-matter content and good tilth. When residue is removed following harvest of such crops as peanuts, silage crops, and other crops, a cover crop is needed. The hazard of erosion is slight to moderate.

This soil is well suited to needleleaf trees. There are no soil-related management concerns. Species suitable for planting are slash pine, loblolly pine, and longleaf pine. Capability unit IIe–12; woodland suitability group 2o1.

Dothan sandy loam, 5 to 8 percent slopes (DoC).—This soil is on narrow ridgetops and side slopes. The profile of this soil is similar to the one described as representative of the series, but the surface layer is slightly thinner, and depth to the layer that has plinthite is 4 to 6 inches shallower.

Included with this soil in mapping are soils that have a loamy sand surface layer, soils that have a sur-

Figure 5.—Tomatoes growing on Dothan sandy loam, 2 to 5 percent slopes (foreground) and Ardilla sandy loam, 0 to 2 percent slopes (background).

face layer less than 4 inches thick, and soils where the upper part of the subsoil is sandy loam. Some small areas of soils where depth to the layer with plinthite is less than 24 inches, soils that have slopes of less than 5 percent, and soils that have slopes of more than 8 percent are included. Also included are a few small areas of Esto, Fuquay, Lucy, and Orangeburg soils.

Corn, peanuts, small grain, soybeans, truck crops, grain sorghum, bahiagrass, and Coastal bermudagrass (fig. 7) are commonly grown crops. Such effective erosion-control practices as contour farming, contour stripcropping, grassed waterways, terraces, diversions, and minimum tillage are needed on cultivated fields. Cropping systems should use a close-growing perennial sod about 3 years out of 5. Crop residue should be returned to the soil to help maintain organic-matter content and good tilth. When residue is removed following harvest of such crops as peanuts, silage crops, and other crops, a cover crop is needed.

This soil is well suited to needleleaf trees. There are no soil-related management concerns. Species suitable for planting are slash pine, loblolly pine, and longleaf pine. Capability unit IIIe–12; woodland suitability group 2o1.

Esto Series

The Esto series consists of deep, well drained or moderately well drained soils on uplands. These soils have slopes of 2 to 12 percent. They formed in marine deposits of unconsolidated sandy clay and clay. Elevations range from 200 to 300 feet.

In a representative profile the surface layer is 6 inches of dark yellowish-brown loamy sand. The upper 10 inches of the subsoil is light yellowish-brown sandy clay, the next 13 inches is light yellowish-brown sandy clay mottled with yellowish brown and light gray, and the lower 41 inches is light-gray clay mottled with strong brown and light reddish brown.

Esto soils have moderate available water capacity. Permeability is slow. Organic-matter content and natural fertility are low. The native vegetation was a moderately dense stand of mixed hardwoods and pines. Nearly all of the acreage has been cleared and is used for pasture, hay, and row crops.

Representative profile of Esto loamy sand, 5 to 12 percent slopes, 3 miles east-northeast of Fadette in the NE¼NE¼ sec. 13, T. 1 N., R. 25 E., in an idle field:

Figure 6.—Wheat ready for harvest on Dothan sandy loam, 2 to 5 percent slopes. When this crop is harvested, the land will be prepared and planted to soybeans.

Ap—0 to 6 inches, dark yellowish-brown (10YR 4/4) loamy sand; weak, fine, granular structure; very friable; common fine roots; strongly acid; abrupt, smooth boundary.

B21t—6 to 16 inches, light yellowish-brown (10YR 6/4) sandy clay; moderate, medium, subangular blocky structure; firm; slightly sticky and slightly plastic; patchy clay films on faces of peds; strongly acid; gradual, smooth boundary.

B22t—16 to 29 inches, light yellowish-brown (10YR 6/4) sandy clay that has common, medium, distinct mottles of yellowish brown (10YR 5/8) and light gray (10YR 7/1); moderate to strong, medium, subangular blocky structure; firm; sticky and plastic; very thin clay films on faces of peds; very strongly acid; gradual, wavy boundary.

B23t—29 to 70 inches, light-gray (10YR 7/2) clay that has common, coarse, distinct mottles of light reddish brown (5YR 6/4) and strong brown (7.5YR 5/6); moderate to strong, medium, subangular blocky structure; firm; sticky and plastic; thin clay films on faces of peds; very strongly acid.

The Ap horizon is very dark gray, dark brown, dark grayish brown, dark yellowish brown, grayish brown, or brown. The B1 horizon, where present, is yellowish-brown, reddish-yellow, or light yellowish-brown sandy clay loam or clay loam. The B21t horizon is yellowish-brown, brownish-yellow, or strong-brown sandy clay or clay. The B22t horizon generally has a matrix color within the range of the B21t horizon, but in places it is mottled yellow, brown, red, and gray. The B22t horizon is sandy clay or clay. The B23t horizon is mottled yellow, brown, red, and gray or is gray, light gray, or light brownish gray mottled with yellow, brown, and red. It is sandy clay or clay. Iron concretions are less than 5 percent, by volume, of the Ap, B21t, and B22t horizons. Reaction is strongly acid or very strongly acid throughout.

Esto soils are adjacent to, and have more clay in the B horizon than, Dothan and Orangeburg soils. Esto soils do not have plinthite in the B horizon, and Dothan soils do. They are not so red in the B horizon as Orangeburg soils.

Esto loamy sand, 2 to 5 percent slopes (EsB).—This soil is on ridgetops and knolls. The profile of this soil is similar to the one described as representative of the series, but the surface layer is 1 to 2 inches thinner and the upper part of the subsoil is 2 to 4 inches thinner.

Included with this soil in mapping are soils that have a sandy loam surface layer and soils where the upper 10 inches of the subsoil is sandy clay loam. Soils that have slopes of less than 2 percent and soils that have slopes of slightly more than 5 percent are included. Also included are some small areas of Dothan and Orangeburg soils.

Figure 7.—**Coastal bermudagrass on Dothan sandy loam, 5 to 8 percent slopes. This crop produces good yields for grazing or hay, and it is excellent for erosion control.**

Corn, peanuts, soybeans, Coastal bermudagrass, and bahiagrass are the crops most commonly grown on this soil. Such effective erosion-control practices as contour farming, contour stripcropping, grassed waterways, terraces, and minimum tillage are needed on cultivated fields. Cropping systems should use close-growing plants about 2 years out of 3. Crop residues should be returned to the soil to help maintain organic-matter content and good tilth. The hazard of erosion is moderate.

This soil is better suited to needleleaf trees than to other uses. There are no serious soil-related management concerns. Species suitable for planting are slash pine and loblolly pine. Capability unit IIIe–11; woodland suitability group 3o1.

Esto loamy sand, 5 to 12 percent slopes (EsC).—This soil is on narrow ridgetops and dissected side slopes. Slopes are dominantly 5 to 8 percent. The soil has the profile described as representative of the series.

Included with this soil in mapping are soils that have a sandy loam surface layer, soils where the upper 10 inches of the subsoil is sandy clay loam, and soils that have slopes of less than 5 percent. Also included are small areas of Dothan and Orangeburg soils.

Cultivated row crops are not commonly grown on this soil. Bahiagrass and Coastal bermudagrass are well suited. If cultivated crops are grown, they should be planted on the contour and not be grown more than 1 year out of 4. The hazard of erosion is severe.

This soil is better suited to needleleaf trees than to most other uses. There are no serious soil-related management concerns. Species suitable for planting are slash pine and loblolly pine. Capability unit IVe–11; woodland suitability group 3o1.

Eunola Series

The Eunola series consists of deep, moderately well drained soils on stream terraces. These soils have slopes of 0 to 2 percent. They formed in old, stream-deposited sediment. Elevations range from 100 to 150 feet.

In a representative profile the surface layer is dark grayish-brown sandy loam 5 inches thick. The subsoil is 51 inches thick. The upper 21 inches is yellowish-brown sandy loam and sandy clay loam; the next 26 inches is mottled yellowish-brown, light-gray, light yellowish-brown, and yellowish-red sandy clay loam; and the lower 4 inches is brownish-yellow sandy loam mottled with very pale brown. The underlying material, to a depth of 65 inches, is mottled white, very pale brown, brownish-yellow, and yellowish-red sand.

Eunola soils have moderate available water capacity. Permeability is moderate in the subsoil and rapid in the underlying material. The seasonal high water table is within 24 inches of the surface 4 to 6 months of the year, from January to May. Organic-matter content and natural fertility are low. The native vegetation was a dense stand of mixed hardwoods and pines. Most of the acreage has been cleared and is used for row crops, pasture, and hay.

Representative profile of Eunola sandy loam, 1 mile north-northeast of bridge on Alabama Highway 87 crossing Pea River in the SW¼NE¼NW¼SW¼ sec. 31, T. 1 N., R. 21 E., in a pine plantation:

Ap—0 to 5 inches, dark grayish-brown (10YR 4/2) sandy loam; weak, fine, granular structure; very friable; few fine roots; strongly acid; abrupt, smooth boundary.

B1—5 to 10 inches, yellowish-brown (10YR 5/4) sandy loam; weak, fine, subangular blocky structure; very friable; sand grains coated and bridged with clay; strongly acid; clear, smooth boundary.

B21t—10 to 26 inches, yellowish-brown (10YR 5/6) sandy clay loam; moderate, medium, subangular blocky structure; friable; thin patchy clay films on faces of peds; strongly acid; gradual, smooth boundary.

B22t—26 to 52 inches, mottled yellowish-brown (10YR 5/6), light yellowish-brown (10YR 6/4), light-gray (10YR 7/2), and yellowish-red (5YR 4/8) sandy clay loam; moderate, medium, subangular blocky structure; friable; thin nearly continuous clay films on faces of peds; very strongly acid; clear, smooth boundary.

B3—52 to 56 inches, brownish-yellow (10YR 6/6) sandy loam that has common, medium, prominent mottles of very pale brown (10YR 8/4); very weak, fine subangular blocky structure; very friable; sand grains coated, some bridged with clay; very strongly acid; gradual, smooth boundary.

IIC—56 to 65 inches, mottled white (10YR 8/1), very pale brown (10YR 8/4), brownish-yellow (10YR 6/6), and yellowish red (5YR 4/8) sand; single grained; loose; strongly acid.

The Ap horizon is very dark grayish brown, dark grayish brown, grayish brown, or yellowish brown. The A2 horizon, where present, is pale-brown sandy loam or loamy sand. The B1 horizon is yellowish-brown, brownish-yellow, or very pale brown sandy loam or fine sandy loam. The B21t horizon is yellowish brown or strong brown. The B22t horizon is mottled in shades of brown, yellow, red, and gray. It is sandy clay loam or sandy clay. The B3 horizon is similar in color to the B22t horizon. The IIC horizon is yellowish brown, light yellowish brown, yellow, light gray, white, or very pale brown or is mottled in shades of these colors. It ranges from loamy sand to sand. Reaction is strongly acid or very strongly acid throughout.

Eunola soils are adjacent to Alpin, Bigbee, Kalmia, Leaf, Lenoir, and Plummer soils. Eunola soils are not so sandy throughout as Alpin and Bigbee soils. They are not so well drained as Kalmia soils but are better drained than Leaf, Lenoir, and Plummer soils. Eunola soils have less clay in the upper part of the B horizon than Leaf and Lenoir soils. They do not have the thick sandy A horizon of Plummer soils.

Eunola sandy loam (Eu).—This nearly level soil is on broad stream terraces. It has the profile described as representative of the series.

Included with this soil in mapping are soils that have a loamy sand surface layer and soils where the upper part of the subsoil is sandy clay or clay. Also included are some small areas of Alpin, Kalmia, Leaf, Lenoir, and Plummer soils.

Corn, soybeans, bahiagrass, and Coastal bermudagrass are commonly grown on this soil. Response to lime and fertilizer is good. Cultivated row crops can be grown each year when good management practices are used. Shallow field ditches can be installed to improve drainage on some fields. Crop residues should be returned to the soil to help maintain organic-matter content. Tillage operations generally are delayed in spring because of wetness.

This soil is suited to broadleaf trees or needleleaf trees. Soil-related management concerns are moderate equipment restrictions and slight to moderate seedling mortality. Species suitable for planting are cottonwood, sweetgum, sycamore, yellow-poplar, slash pine, and loblolly pine. Capability unit IIw-15; woodland suitability group 2w8.

Fuquay Series

The Fuquay series consists of deep, well-drained soils on uplands. These soils have slopes of 1 to 5 percent. They formed in marine deposits of unconsolidated sandy loam and sandy clay loam. Elevations range from 175 to 225 feet.

In a representative profile the surface layer is dark grayish-brown loamy sand 9 inches thick. The subsurface layer is yellowish-brown loamy sand 14 inches thick. The subsoil is 57 inches thick. The upper 10 inches is yellowish-brown sandy loam; the next 11 inches is yellowish-brown sandy clay loam; the next 12 inches is strong-brown sandy clay loam mottled with brownish yellow, yellowish red, and light gray and is 20 percent plinthite; and the lower 24 inches is mottled yellow, light-gray, strong-brown, and red sandy clay loam.

Fuquay soils have moderate available water capacity. Permeability is moderately rapid in the upper part of the subsoil and slow in the lower part. The seasonal high water is at a depth of more than 5 feet. Organic-matter content and natural fertility are low. The native vegetation was a moderately dense stand of mixed hardwoods and pines. Nearly all of the acreage has been cleared and is used for row crops, pasture, and hay.

Representative profile of Fuquay loamy sand, 1 to 5 percent slopes, 6 miles east-southeast of Geneva in the SE¼NE¼NE¼ sec. 19, T. 7 N., R. 15 W., in pasture:

Ap—0 to 9 inches, dark grayish-brown (10YR 4/2) loamy sand; weak, fine, granular structure; very friable; common fine and medium roots; strongly acid; abrupt, smooth boundary.

A2—9 to 23 inches, yellowish-brown (10YR 5/8) loamy sand; single grained; loose; common fine and medium roots; strongly acid; gradual, smooth boundary.

B1—23 to 33 inches, yellowish-brown (10YR 5/8) sandy loam; weak, fine, granular structure; very friable; sand grains bridged and coated with clay; strongly acid; clear, smooth boundary.

B21t—33 to 44 inches, yellowish-brown (10YR 5/8) sandy clay loam; weak, fine and medium, subangular blocky structure; friable; 3 percent plinthite; thin patchy clay films on faces of peds; strongly acid; abrupt, smooth boundary.

B22t—44 to 56 inches, strong-brown (7.5YR 5/6) sandy clay loam that has common, fine, distinct mottles of yellowish red (5YR 5/8), brownish yellow (10YR 6/8), and light gray (10YR 7/2); moderate, medium, subangular blocky structure; firm; 20 percent plinthite; thin patchy clay films on

faces of peds; very strongly acid; clear, wavy boundary.

B23t—56 to 80 inches, mottled yellow (10YR 8/6), light-gray (10YR 7/2), strong-brown (7.5YR 5/8), and red (2.5YR 5/8) sandy clay loam; moderate, medium, subangular blocky structure; firm; thin patchy clay films on faces of peds; very strongly acid.

The Ap horizon is grayish brown or dark grayish brown. The A2 horizon is yellowish brown, brownish yellow, light yellowish brown, or pale brown. The B1 horizon is yellowish brown, brownish yellow, reddish yellow, or strong brown. The B2t horizon is strong brown, yellowish brown, or brownish yellow. Yellow, brown, red, and gray mottles are common to many. Reaction is strongly acid or very strongly acid throughout.

Fuquay soils are adjacent to Ardilla, Bonifay, Dothan, and Lucy soils. Fuquay soils have a thicker, sandier A horizon than Ardilla and Dothan soils, but it is not so thick as that of Bonifay soils. Fuquay soils are better drained than Ardilla soils. They have plinthite in the B horizon and Lucy soils do not.

Fuquay loamy sand, 1 to 5 percent slopes (FuB).—This soil is on broad ridgetops and side slopes. It is the only Fuquay soil mapped in the county.

Included with this soil in mapping are some small areas of Ardilla, Bonifay, Dothan, Lucy, Orangeburg, and Troup soils.

This soil is suited to all crops commonly grown in the county. Corn, peanuts (fig. 8), soybeans, grain sorghum, small grain, tomatoes, bahiagrass, and Coastal bermudagrass are the main crops. Response to lime and fertilizer is good. Cultivated crops can be grown each year when good management practices are used. Crop residues should be returned to the soil to help maintain organic-matter content.

This soil is better suited to needleleaf trees than to most other uses. Soil-related management concerns are moderate seedling mortality and slight to moderate equipment restrictions. Species suitable for planting are loblolly pine, slash pine, and longleaf pine. Capability unit IIs–14; woodland suitability group 3s2.

Grady Series

The Grady series consists of deep, poorly drained soils on uplands. These soils have slopes of 0 to 2 percent. They formed in clayey marine deposits. Elevations range from 200 to 250 feet.

In a representative profile the surface layer is 12 inches of dark-gray silt loam. The subsoil is 53 inches thick. The upper 6 inches is dark-gray sandy clay and

Figure 8.—Peanuts growing on Fuquay loamy sand, 1 to 5 percent slopes.

the lower 47 inches is gray clay mottled with very dark gray and light gray.

Grady soils have moderate available water capacity. Permeability is slow. The seasonal high water table is at or near the surface 6 to 8 months yearly and is ponded 2 to 4 months late in winter and in spring. Organic-matter content is moderate, and natural fertility is low. The native vegetation was a moderate to dense stand of gum, cypress, and oak. Only a small acreage has been cleared, and it is used for pasture.

Representative profile of Grady silt loam, 3 miles south of Hartford in the NE¼SE¼NW¼ sec. 13, T. 1 N., R. 23 E., in woods:

A—0 to 12 inches, dark-gray (10YR 4/1) silt loam; weak, fine, subangular blocky structure; slightly sticky; very strongly acid; clear, smooth boundary.

B21tg—12 to 18 inches, dark-gray (10YR 4/1) sandy clay; weak, fine to medium, subangular blocky structure; slightly plastic; very strongly acid; clear, smooth boundary.

B22tg—18 to 65 inches, gray (10YR 5/1) clay that has few, fine to medium, very dark gray (10YR 3/1) and light-gray (10YR 6/1) mottles; weak, fine to medium, subangular blocky structure; plastic; very strongly acid.

The A horizon is dark gray or very dark grayish brown. The B2t horizon is dark gray, gray, or light gray. In most places, the lower part of the B horizon has common yellow, brown, or red mottles. The B2t horizon is clay or sandy clay. Reaction is strongly acid or very strongly acid throughout.

Grady soils are adjacent to Ardilla, Bibb, Byars, Osier, and Rains soils. They are more poorly drained than Ardilla soils, and they are more clayey throughout than Ardilla, Bibb, Osier, and Rains soils. Grady soils have a lighter gray A horizon than Byars soils.

Grady silt loam (Gr).—This nearly level soil is in depressions, on broad flats, and along some gently flowing streams. It has the profile described as representative of the series.

Included with this soil in mapping are soils that have a loam or clay loam surface layer and soils where the surface layer and subsoil are less than 60 inches thick. Also included are a few small areas of Ardilla, Bibb, Byars, and Rains soils.

This soil is used mainly for woodland. Drainage is required before pasture or cultivated crops can be grown. Bahiagrass, tall fescue, and white clover are suited to drained areas.

This soil is suited to broadleaf or needleleaf trees if the surface layer is adequately drained. Soil-related management concerns in inadequately drained areas are severe equipment restrictions and severe seedling mortality. Species suitable for planting are loblolly pine, slash pine, sycamore, and cottonwood. Capability unit Vw–11; woodland suitability group 2w9.

Kalmia Series

The Kalmia series consists of deep, well-drained soils on stream terraces. These soils have slopes of 0 to 3 percent. They formed in old, stream-deposited sediment. Elevations range from 80 to 100 feet.

In a representative profile the surface layer is 7 inches of dark grayish-brown loamy sand. The subsoil is 30 inches thick. The upper 4 inches is light olive-brown sandy loam, the next 19 inches is yellowish-brown sandy clay loam, and the lower 7 inches is brownish-yellow sandy loam mottled with yellowish brown and strong brown. The underlying material, to a depth of 80 inches, is light-gray sand.

Kalmia soils have moderate available water capacity. Permeability is moderately rapid in the surface layer and lower part of the subsoil, moderate in the upper part of the subsoil, and rapid in the underlying material. Organic-matter content and natural fertility are low. The native vegetation was a moderately dense stand of mixed hardwoods and pines. Most of the acreage has been cleared and is used for row crops, pasture, and hay.

Representative profile of Kalmia loamy sand, 0 to 3 percent slopes, 1 mile west of Geneva in the NE¼SE¼NW¼ sec. 30, T. 1 N., R. 22 E., in pasture:

Ap—0 to 7 inches, dark grayish-brown (10YR 4/2) loamy sand; weak, fine, granular structure; very friable; few fine roots; strongly acid; gradual, smooth boundary.

B1—7 to 11 inches, light olive-brown (2.5Y 5/4) sandy loam; weak, medium, subangular blocky structure; friable; sand grains bridged and coated with clay; very strongly acid; clear, smooth boundary.

B2t—11 to 30 inches, yellowish-brown (10YR 5/6) sandy clay loam; moderate, medium, subangular blocky structure; friable; thin patchy clay films on faces of peds; very strongly acid; clear, smooth boundary.

B3t—30 to 37 inches, brownish-yellow (10YR 6/6) sandy loam that has few, fine, faint, yellowish-brown and strong-brown mottles; weak, medium, subangular blocky structure; friable; sand grains bridged and coated with clay; very strongly acid; abrupt, smooth boundary.

IIC—37 to 80 inches, light-gray (10YR 7/2) sand that has few, thin, brownish-yellow sandy loam lamellae; single grained; loose; very strongly acid.

The Ap horizon is gray, dark grayish brown, or light brownish gray. The A2 horizon, where present, is light yellowish-brown or pale-brown loamy sand. The B1 horizon is light olive brown, brownish yellow, or yellow. The B2t horizon is strong brown, yellowish brown, or brownish yellow. The B3 horizon is brownish yellow or yellow, and brown, red, or gray mottles are few to common in places. The IIC horizon is reddish-yellow, brownish-yellow, yellow, light-gray, white, or very pale brown sand or loamy sand. The A horizon is strongly acid, and the B and C horizons are very strongly acid.

Kalmia soils are adjacent to Alpin, Bigbee, Eunola, Leaf, and Lenoir soils. They are not so sandy throughout as Alpin and Bigbee soils. Kalmia soils are better drained than Eunola, Leaf, and Lenoir soils, and they have less clay in the B horizon than Leaf and Lenoir soils.

Kalmia loamy sand, 0 to 3 percent slopes (KaA).—This soil has the profile described as representative of the series. Included in mapping are soils that have a sandy loam surface layer, soils that have a sandy clay or clay subsoil, and soils that are the same texture to a depth of more than 40 inches. Also included are small areas of Alpin, Eunola, Leaf, and Lenoir soils.

This soil is well suited to all crops commonly grown in the county. Corn, soybeans, grain sorghum, small grain, peanuts, Coastal bermudagrass, and bahiagrass are the main crops. Response to lime and fertilizer is good. Cultivated crops can be grown each year when good management practices are used. Crop residues should be returned to the soil to help maintain organic-matter content. The hazard of erosion is slight.

This soil is suited to needleleaf or broadleaf trees.

There are no soil-related management problems. Species suitable for planting are loblolly pine, slash pine, yellow-poplar, sweetgum, and cottonwood trees. Capability unit I–16; woodland suitability group 2o7.

Leaf Series

The Leaf series consists of deep, poorly drained soils on stream terraces. These soils have slopes of 0 to 2 percent. They formed in old, stream-deposited clayey sediment. Elevations range from 80 to 130 feet.

In a representative profile the surface layer is 7 inches of very dark gray and dark grayish-brown loam. The subsurface layer is 6 inches of grayish-brown silt loam mottled with olive yellow. The subsoil is 75 inches thick. The upper 9 inches is dark-gray clay mottled with red; the next 36 inches is dark-gray silty clay mottled with light yellowish brown; and the lower 30 inches is dark-gray clay mottled with black and gray.

Leaf soils have moderate to high available water capacity. Permeability is slow to very slow. The seasonal high water table is within 6 inches of the surface 2 to 4 months each year. Organic-matter content and natural fertility are low. The native vegetation was a moderately dense stand of gums and oaks and some pines. Some of the acreage has been cleared and is used for pasture.

Representative profile of Leaf loam in an area of Leaf-Lenoir complex, 7 miles northeast of Geneva in the NW¼ sec. 26, T. 2 N., R. 22 E., in woods:

A11—0 to 3 inches, very dark gray (10YR 3/1) loam; weak, fine, subangular blocky structure; friable; many fine roots; strongly acid; clear, smooth boundary.

A12—3 to 7 inches, dark grayish-brown (10YR 4/2) loam; weak, fine, subangular blocky structure; friable; common fine roots; strongly acid; clear, smooth boundary.

A2g—7 to 13 inches, grayish-brown (2.5YR 5/2) silt loam that has common, medium, distinct mottles of olive yellow (2.5Y 6/6); weak, fine, subangular blocky structure; friable; strongly acid; clear, smooth boundary.

B21tg—13 to 22 inches, dark-gray (10YR 4/1) clay that has few, medium, prominent mottles of red (2.5YR 4/6); moderate, medium, subangular blocky structure; firm; thin clay films on faces of peds; strongly acid; gradual, smooth boundary.

B22tg—22 to 58 inches, dark-gray (10YR 4/1) silty clay that has few, fine, distinct mottles of light yellowish brown (2.5Y 6/4); moderate, medium, subangular blocky structure; firm; thin clay films on faces of peds; strongly acid; gradual, smooth boundary.

B23tg—58 to 88 inches, dark-gray (5YR 4/1) clay that has pockets of black (5YR 2/1) and gray (10YR 6/1); moderate, medium, subangular blocky structure; firm; thin clay films on faces of peds; strongly acid; gradual, smooth boundary.

The A1 or Ap horizon is very dark gray, dark grayish-brown, or dark-gray loam, silt loam, or sandy loam. The A2 horizon is gray, grayish-brown, or light brownish-gray sandy loam, loam, or silt loam. It has common olive-yellow mottles. The B2tg horizon is dark-gray, gray, light-gray, or light brownish-gray clay or silty clay. It is generally mottled with red, brown, or yellow. Thin bands of silty or sandy material are in some places. Reaction is strongly acid or very strongly acid throughout.

Leaf soils are adjacent to, and more poorly drained than, Alpin, Eunola, Kalmia, and Lenoir soils. Leaf soils contain more clay throughout than Alpin, Eunola, and Kalmia soils.

Leaf-Lenoir complex (Le).—This mapping unit consists of deep, poorly drained and somewhat poorly drained soils on broad stream terraces. Areas are 1,000 to 2,500 feet wide. They consist of meandering, low, depressed areas as much as 400 feet wide separated by low ridges as much as 250 feet wide. Areas generally are wet or swampy throughout most of the year, and some low areas are ponded. Most of the acreage is in good stands of low-grade hardwoods or poor stands of medium quality pines. Slopes range from 0 to 2 percent.

This mapping unit is about 37 percent Leaf soils and 20 percent Lenoir soils. Both soils occur in an intricate pattern in each mapped area. The remaining 43 percent is made up of similar soils that have a less clayey subsoil and soils that have a thinner profile. Included in mapping are areas of Alpin, Eunola, and Kalmia soils.

This is the only mapping unit in which Leaf and Lenoir soils are mapped in the county. For a description of the Lenoir soils in this unit, see the Lenoir series.

These soils are suited to needleleaf and broadleaf trees. They have severe equipment restrictions and moderate seedling mortality. Most of the acreage is in hardwoods, but where pine grows, its growth is rapid. Species suitable for planting are slash pine, loblolly pine, and sweetgum. In adequately drained areas, sycamore and cottonwood can be planted.

These soils are not well suited to row crops because of poor and somewhat poor drainage and a seasonal high water table. The areas at higher elevations are suited to adapted grasses and legumes for pasture.

These soils have severe limitations for homesites, septic-tank absorption fields, and recreational uses such as playgrounds, camp areas, and picnic areas. They are suited to habitat for such game animals as rabbit, quail, squirrel, and deer. Capability unit IVw–11; woodland suitability group 2w9.

Lenoir Series

The Lenoir series consists of deep, somewhat poorly drained soils on stream terraces. These soils have slopes of 0 to 2 percent. They formed in old, stream-deposited clayey sediment. Elevations range from 80 to 130 feet.

In a representative profile the surface layer is very dark gray sandy loam 7 inches thick. The upper 6 inches of the subsoil is yellowish-brown sandy clay loam mottled with yellowish red and very dark gray, and the lower 81 inches is gray clay mottled with red and yellowish brown.

Lenoir soils have moderate available water capacity. Permeability is moderate in the upper part of the subsoil and slow in the lower part. The seasonal high water table is within 12 inches of the surface 2 to 5 months of the year. Organic-matter content and natural fertility are low. The native vegetation was a moderately dense stand of gums and oaks and some pines. Some of the acreage has been cleared and is used for pasture and row crops.

Lenoir soils in Geneva County are mapped only in a complex with Leaf soils.

Representative profile of Lenoir sandy loam in an area of Leaf-Lenoir complex, 5 miles south-southwest of Samson in the NE¼SE¼NW¼ sec. 20, T. 1 N., R. 20 E., in pasture:

Ap—0 to 7 inches, very dark gray (10YR 3/1) sandy loam; weak, fine, granular structure; very friable; many fine roots; strongly acid; clear, wavy boundary.

B1—7 to 13 inches, yellowish-brown (10YR 5/4) sandy clay loam that has few, fine, faint mottles of yellowish red (5YR 4/8) and very dark gray (10YR 3/1); weak, medium, subangular blocky structure; friable; very strongly acid; gradual, wavy boundary.

B21tg—13 to 29 inches, gray (10YR 6/1) clay that has common, medium, prominent mottles of red (2.5YR 4/8) and few, fine, faint mottles of yellowish brown; moderate, medium, subangular blocky structure; firm; few fine mica flakes; very strongly acid; gradual, wavy boundary.

B22tg—29 to 94 inches, gray (10YR 6/1) clay that has common, coarse, prominent mottles of yellowish brown (10YR 5/8) and red (2.5Y 4/8); moderate, medium, subangular blocky structure; firm; very strongly acid.

The Ap horizon is very dark gray, dark-gray, dark grayish-brown, or grayish-brown sandy loam, loam, or silt loam. The A2 horizon, where present, is brown, light yellowish-brown, or pale-brown sandy loam. The B1 horizon is yellowish brown, pale brown, or light olive brown mottled in shades of red and gray. It is mainly sandy clay loam but ranges to loam or clay loam. The B21tg and B22tg horizons are dominantly clay but range to silty clay or clay loam. Reaction is strongly acid or very strongly acid throughout.

Lenoir soils are adjacent to Alpin, Eunola, Kalmia, and Leaf soils. Lenoir soils have more clay throughout than all these soils except Leaf soils. They are more poorly drained than Alpin, Eunola, and Kalmia soils but are better drained than Leaf soils.

Lucy Series

The Lucy series consists of deep, well-drained soils on uplands. These soils have slopes of 0 to 5 percent. They formed in marine deposits of unconsolidated sandy loam and sandy clay loam. Elevations range from 150 to 300 feet.

In a representative profile the surface layer is 10 inches of brown loamy sand. The subsurface layer is 20 inches of yellowish-red loamy sand. The subsoil is 50 inches of red sandy clay loam.

Lucy soils have low to moderate available water capacity. Permeability is rapid in the surface layer and moderate in the subsoil. Organic-matter content and natural fertility are low. The native vegetation was a moderately dense stand of mixed hardwoods and pines. Most of the acreage has been cleared and is used for row crops, pasture, and hay.

Representative profile of Lucy loamy sand, 0 to 5 percent slopes, 4.5 miles east-northeast of Samson in the SE¼NE¼SW¼ sec. 20, T. 2 N., R. 21 E., in a field:

Ap—0 to 10 inches, brown (10YR 4/3) loamy sand; single grained; very friable; few fine roots; strongly acid; abrupt, smooth boundary.

A3—10 to 30 inches, yellowish-red (5YR 4/8) loamy sand; weak, fine, granular structure; friable to very friable; strongly acid; clear, smooth boundary.

B2t—30 to 80 inches, red (2.5YR 4/6) sandy clay loam; moderate, medium, subangular blocky structure; friable; strongly acid.

The Ap horizon is dark grayish brown, dark brown, or brown. The A2 horizon, where present, is yellowish-brown, brownish-yellow, or strong-brown loamy sand or sand. The B1 horizon, where present, is yellowish-brown, strong-brown, yellowish-red or red sandy loam. The B2t horizon is yellowish-red or red sandy loam, sandy clay loam, or clay loam. Reaction is strongly acid throughout.

Lucy soils are adjacent to Alaga, Bonifay, Fuquay, Orangeburg, Red Bay, and Troup soils. Lucy soils are not so sandy throughout as Alaga soils, and the A horizon is not so thick as that of Bonifay and Troup soils. Lucy soils do not have plinthite in the B horizon, as is characteristic in Fuquay soils. The A horizon is thicker than that of Orangeburg and Red Bay soils.

Lucy loamy sand, 0 to 5 percent slopes (LuB).—This soil is on broad ridgetops and side slopes. It has the profile described as representative of the series.

Included with this soil in mapping are soils that have a yellowish-brown, strong-brown, or dark-red subsoil and soils that have slopes of more than 5 percent. Also included are some small areas of Bonifay, Fuquay, Orangeburg, Red Bay, and Troup soils.

Corn, soybeans, peanuts (fig. 9), small grain, truck crops, bahiagrass, and Coastal bermudagrass are commonly grown on this soil. Early-maturing truck crops and crops that grow during the cool season of the year are better suited than most others. Crops such as corn, soybeans, and grain sorghum generally suffer from lack of moisture. Response to lime and fertilizer is moderate. Leaching of plant nutrients is a concern, and split applications of fertilizer are generally beneficial. The less sloping areas of this soil can be row cropped each year when good management practices are used, but the more sloping areas should have conservation practices to help prevent concentrations of runoff. Crop residues should be returned to the soil. When residue is removed following harvest of such crops such as peanuts, a cover crop is needed.

This soil is well suited to needleleaf trees. Soil-related management concerns include moderate seedling mortality and slight to moderate equipment restrictions. Species for planting are loblolly pine, slash pine, and longleaf pine. Capability unit IIs–14; woodland suitability group 3s2.

Orangeburg Series

The Orangeburg series consists of deep, well-drained soils on uplands. These soils have slopes of 0 to 8 percent. They formed in marine deposits of unconsolidated sandy clay loam. Elevations range from 200 to 300 feet.

In a representative profile the surface layer is 7 inches of brown sandy loam. The upper 5 inches of the subsoil is yellowish-red sandy clay loam, and the lower 63 inches is red sandy clay loam.

Orangeburg soils have moderate available water capacity. Permeability is moderate. Organic-matter content and natural fertility are low. The native vegetation was a moderately dense stand of mixed hardwoods and pines. Nearly all of the acreage has been cleared and is used for row crops, pasture, and hay.

Representative profile of Orangeburg sandy loam, 2 to 5 percent slopes, 1.5 miles northwest of Hartford in the SW¼NE¼NW¼ sec. 26, T. 2 N., R. 23 E., in a field:

Ap—0 to 7 inches, brown (7.5YR 4/4) sandy loam; weak fine, granular structure; very friable; common fine roots; strongly acid; abrupt, smooth boundary.

Figure 9.—**Peanuts on Lucy loam ysand, 0 to 5 percent slopes. Contour farming helps reduce erosion.**

B21t—7 to 12 inches, yellowish-red (5YR 4/6) and a few mixed areas of brown (7.5YR 4/4) sandy clay loam; weak, medium, subangular, blocky structure; friable; strongly acid; abrupt, smooth boundary.

B22t—12 to 21 inches, red (2.5YR 4/6) sandy clay loam; moderate, medium, subangular blocky structure; friable; thin patchy clay films on faces of peds; very strongly acid; clear, smooth boundary.

B23t—21 to 65 inches, red (2.5YR 4/6) sandy clay loam; moderate, medium, subangular blocky structure; friable; thin patchy clay films on faces of peds; very strongly acid; clear, smooth boundary.

B24t—65 to 75 inches, red (2.5YR 4/6) sandy clay loam that has common, medium, distinct mottles of brownish yellow (10YR 6/6); moderate, medium, subangular blocky structure; friable; thin patchy clay films on faces of peds; very strongly acid.

The Ap horizon is very dark grayish brown, dark grayish brown, or brown. The B1 horizon, where present, is yellowish-brown, strong-brown, reddish-brown, or yellowish-red sandy loam. The B2t horizon is yellowish red or red. It is dominantly sandy clay loam but ranges to sandy loam or sandy clay. Iron concretions are less than 5 percent of the soil material throughout. Reaction is strongly acid in the A horizon and strongly acid or very strongly acid in the B horizon.

Orangeburg soils are adjacent to Dothan, Esto, Lucy, Red Bay, and Troup soils. Orangeburg soils have a B horizon that is redder than that of Dothan and Esto soils. They do not contain as much plinthite as Dothan soils do, and they have less clay in the B horizon than Esto soils. Orangeburg soils do not have the thick, sandy A horizon of Lucy and Troup soils. They are not so red in the B horizon as Red Bay soils.

Orangeburg sandy loam, 0 to 2 percent slopes (OrA).—This soil is on moderate to broad ridgetops. Included in mapping are soils that have a loamy sand surface layer, soils that are dark red below a depth of 30 inches, and soils that have slopes of more than 2 percent. Also included are a few small areas of Dothan, Esto, Lucy, and Red Bay soils.

This soil is well suited to all crops commonly grown in the county. Corn, peanuts, soybeans, grain sorghum, small grain, truck crops, bahiagrass, and Coastal bermudagrass are commonly grown. Response to lime and fertilizer is good. Cultivated row crops can be grown each year when good management practices are used. Crop residues should be returned to the soil to help maintain organic-matter content.

This soil is better suited to needleleaf trees than to most other uses. There are no soil-related management concerns. Species suitable for planting are slash pine, loblolly pine, and longleaf pine. Capability unit I–12; woodland suitability group 2o1.

Orangeburg sandy loam, 2 to 5 percent slopes (OrB).—This soil is on moderate to broad ridgetops and side slopes. It has the profile described as representative of the series.

Included with this soil in mapping are soils that have a loamy sand surface layer, soils that are dark red below a depth of 20 inches, soils that have slopes of less than 2 percent, and soils that have slopes of more than 5 percent. Also included are some small areas of Dothan, Esto, Lucy, and Red Bay soils.

Corn (fig. 10), peanuts, grain sorghum, soybeans, small grain, truck crops, bahiagrass, and Coastal bermudagrass are commonly grown on this soil. Response to lime and fertilizer is good. Such effective erosion-control practices as contour farming, grassed waterways, contour stripcropping, terraces, and minimum tillage are needed when this soil is used for cultivated crops. Conservation cropping systems should use a close-growing crop about 1 year out of 2. Crop residues should be returned to the soil. When residue is removed following harvest of such crops as peanuts, a cover crop is needed.

This soil is better suited to needleleaf trees than to most other uses. There are no soil-related management concerns. Species suitable for planting are slash pine, loblolly pine, and longleaf pine. Capability unit IIe–12; woodland suitability group 2o1.

Orangeburg sandy loam, 5 to 8 percent slopes (OrC).—This soil is on narrow to moderately broad ridgetops and side slopes. The profile of this soil is similar to the one described as representative of the series, but the surface layer is 2 to 3 inches thinner.

Included with this soil in mapping are soils that have a loamy sand surface layer, soils that have slopes of less than 5 percent, and soils that have slopes of more than 8 percent. Also included are a few small areas of Dothan, Esto, Lucy, Red Bay, and Troup soils.

Corn, peanuts, grain sorghum, soybeans, small grain, bahiagrass, and Coastal bermudagrass are commonly grown on this soil. Response to lime and fertilizer is good. Such effective erosion-control practices as contour farming, contour stripcropping, grassed waterways, terraces, diversions, and minimum tillage are needed when this soil is used for cultivated crops. Cropping systems should use a close-growing perennial sod about 3 years out of 5. Crop residues should be returned to the soil to help maintain organic-matter content and

Figure 10.—Corn growing on Orangeburg sandy loam, 2 to 5 percent slopes.

good tilth. When residue is removed following harvest of such crops as peanuts, a cover crop is needed.

This soil is better suited to needleleaf trees than to most other uses. There are no soil-related management concerns. Species suitable for planting are slash pine, loblolly pine, and longleaf pine. Capability unit IIIe–12; woodland suitability group 2o1.

Osier Series

The Osier series consists of deep, poorly drained or very poorly drained soils along streams and drainageways. These soils have slopes of 0 to 2 percent. They formed in alluvium washed from surrounding uplands. Elevations range from 70 to 150 feet.

In a representative profile the surface layer is dark-gray loam 7 inches thick. The underlying material extends to a depth of 65 inches. The upper 21 inches is dark-gray loamy sand that is mottled with light gray and that has thin strata of gray sandy loam; the next 22 inches is mottled dark-gray, light-gray, and yellowish-brown sand; and the lower 15 inches is mottled light-gray and grayish-brown sand.

Osier soils have low available water capacity. Permeability is rapid. The seasonal high water table is within 12 inches of the surface for 3 to 6 months of the year. The soils are subject to very frequent flooding throughout the year. Organic-matter content is low or very low, and natural fertility is low. The native vegetation was a dense stand of mixed hardwoods. All of the acreage of this soil is in forest.

Osier soils in Geneva County are mapped only with Bibb soils.

Representative profile of Osier loam in an area of Bibb and Osier soils, frequently flooded, 5 miles south of Slocomb in the NW¼NW¼NW¼ sec. 29, T. 1 N., R. 25 E., in woods:

Ap—0 to 7 inches, dark-gray (10YR 4/1) loam that has common, medium, distinct mottles of brown (7.5YR 4/4); weak, fine, granular structure; friable; common fine and medium roots; strongly acid; clear, smooth boundary.

C1—7 to 28 inches, dark-gray (10YR 4/1) loamy sand that has common, medium, distinct mottles of light gray (10YR 7/1) and thin strata of gray (10YR 5/1) sandy loam; very weak, fine, granular structure; very friable; very strongly acid; gradual, smooth boundary.

C2—28 to 50 inches, mottled dark-gray (10YR 4/1), light-gray (10YR 7/2), and yellowish-brown (10YR 5/4) sand; single grained; loose; very strongly acid; gradual, smooth boundary.

C3—50 to 65 inches, mottled light-gray (10YR 7/2) and grayish-brown (10YR 5/2) sand; single grained; loose; very strongly acid.

The A horizon is dark-gray, very dark grayish-brown, or grayish-brown loam, sandy loam, loamy sand, or sand. It has few or common mottles in shades of yellow or brown. The C horizon is dark-gray, light brownish-gray, or light-gray loamy sand or sand that has thin strata of loam or sandy loam. It has common yellow or brown mottles. Reaction ranges from strongly acid to very strongly acid throughout.

Osier soils are adjacent to, and contain less clay throughout than, Bibb, Chastain, Grady, Leaf, Lenoir, and Plummer soils. Osier soils are more poorly drained than Lenoir soils.

Plummer Series

The Plummer series consists of deep, poorly drained soils on foot slopes, stream terraces, and uplands. These soils have slopes of 0 to 2 percent. They formed in marine deposits of unconsolidated loamy sand and sandy loam. Elevations range from 130 to 150 feet.

In a representative profile the surface layer is black loamy sand 5 inches thick. The upper 17 inches of the subsurface layer is light-gray sand, and the lower 23 inches is gray and pale-brown sand. The subsoil is 17 inches thick. It is gray sandy loam mottled with light gray.

Plummer soils have low available water capacity. Permeability is moderately rapid in the surface layer and moderate in the subsoil. Organic-matter content and natural fertility are low. The seasonal high water table is within 12 inches of the surface 4 to 8 months of the year. The native vegetation was a dense stand of mixed hardwood and pines. Only a small acreage has been cleared, and it is used for pasture.

Representative profile of Plummer loamy sand, 2.25 miles east of Geneva in the NE¼SE¼SE¼ sec. 22, T. 1 N., R. 22 E., in woods:

A1—0 to 5 inches, black (N 2/0) loamy sand; massive; slightly sticky; high content of organic matter; strongly acid; clear, smooth boundary.

A21g— 5 to 22 inches, light-gray (10YR 6/1) sand; single grained; very strongly acid; clear, smooth boundary.

A22g—22 to 45 inches, gray (10YR 5/1) and pale-brown (10YR 6/3) sand; single grained; very strongly acid; abrupt, smooth boundary.

Btg—45 to 62 inches, gray (10YR 6/1) sandy loam that has common, medium, faint mottles of light gray and pockets of sand and sandy clay loam; massive; sticky; very strongly acid.

The A1 horizon is black, very dark gray, very dark grayish brown, or dark gray. The A2g horizon is gray or light-gray loamy sand or sand. It has few to common mottles in shades of yellow or brown. The Btg horizon is gray or light-gray sandy loam or sandy clay loam. It has few to common mottles in shades of yellow or brown. Reaction is strongly acid or very strongly acid throughout.

Plummer soils are adjacent to Ardilla, Bibb, Byars, Eunola, Osier, and Rains soils. Plummer soils are more poorly drained than Ardilla and Eunola soils. They have more distinct profile development than Bibb and Osier soils. Plummer soils have a thicker sandy A horizon than Ardilla, Bibb, Byars, Eunola, and Rains soils.

Plummer loamy sand (Pm).—This nearly level soil is on low or depressional areas on foot slopes, stream terraces, and uplands. It has the profile described as representative of the series.

Included with this soil in mapping are soils that have a sandy loam or loam surface layer, soils that have a sandy surface layer less than 40 inches thick, and soils that have a black or very dark gray surface layer more than 6 inches thick. Also included are some small areas of Ardilla, Bibb, Leaf, and Rains soils.

This soil is used mainly for woodland. It is suited to bahiagrass and tall fescue where drainage is adequate. Response to lime and fertilizer is moderate to good. This soil is too wet for cultivated row crops.

This soil is well suited to needleleaf trees. Soil-related management concerns include severe equipment limitations and seedling mortality on ponded areas. Species suitable for planting are slash pine and loblolly

pine. Capability unit IVw–14; woodland suitability group 2w3.

Rains Series

The Rains series consists of deep, poorly drained soils on uplands. These soils have slopes of 0 to 2 percent. They formed in marine deposits of unconsolidated sandy clay loam and sandy loam. Elevations range from 200 to 250 feet.

In a representative profile the surface layer is black sandy loam 5 inches thick. The subsurface layer is grayish-brown sandy loam 8 inches thick. The subsoil is gray sandy clay loam throughout. The upper 37 inches is mottled with brownish yellow, strong brown, and red, and the lower 15 inches is mottled with yellowish brown and red.

Rains soils have moderate available water capacity. Permeability is moderately rapid in the surface layer and moderate in the subsoil. The seasonal high water table is within 6 inches of the surface 3 to 10 months of the year. Some low areas are ponded for 1 to 3 months late in winter or early in spring. Organic-matter content is low to moderate, and natural fertility is low. The native vegetation was a dense stand of mixed hardwoods and some pines. Only a small acreage has been cleared, and it is used for pasture.

Representative profile of Rains sandy loam, 5.5 miles south of Hartford in the NW¼NW¼SW¼ sec. 30, T. 1 N., R. 24 E., in woods:

A1—0 to 5 inches, black (10YR 2/1) sandy loam; weak, fine, granular structure; very friable; common fine roots; strongly acid; abrupt, smooth boundary.

A2—5 to 13 inches, grayish-brown (10YR 5/2) sandy loam; weak, fine, granular structure; very friable; strongly acid; abrupt, smooth boundary.

B21tg—13 to 31 inches, gray (10YR 6/1) sandy clay loam that has common, medium, prominent mottles of brownish yellow, strong brown, and red; weak, fine, subangular blocky structure; friable; thin patchy clay films on faces of peds; very strongly acid; clear, smooth boundary.

B22tg—31 to 50 inches, gray (10YR 6/1) sandy clay loam that has common, medium, prominent mottles of brownish yellow, strong brown, and red; moderate, medium, subangular blocky structure; friable to firm; thin clay film on faces of peds; very strongly acid; clear, smooth boundary.

B23tg—50 to 65 inches, gray (10YR 5/1) sandy clay loam that has many, medium to coarse, prominent mottles of yellowish brown and red; moderate to strong, medium, subangular blocky structure; firm; thin clay films on faces of peds; very strongly acid.

The A1 horizon is black, very dark gray, or dark gray. The A2 horizon is dark gray, grayish brown, light gray, or light brownish gray. The B2t horizon is dark gray, gray, light gray, or light brownish gray mottled with yellow, brown, and red. Reaction is strongly acid or very strongly acid throught.

Rains soils are adjacent to Ardilla, Byars, Grady, and Plummer soils. Rains soils are more poorly drained than Ardilla soils and not so poorly drained as Byars soils. They do not contain as much plinthite as Ardilla soils, and they have less clay in the B horizon than Byars and Grady soils. They do not have a thick sandy A horizon, and Plummer soils do.

Rains sandy loam (Ra).—This nearly level soil is on upland flats and in depressions. It has the profile described as representative of the series.

Included with the soil in mapping are soils that have a loam or silt loam surface layer, soils that are more than 5 percent plinthite, and soils that are sandy clay and clay below a depth of 36 inches. Also included are a few small areas of Ardilla, Byars, and Grady soils.

This soils is used mainly for woodland. In areas that have suitable outlets and that can be adequately drained, fescue and bahiagrass can be grown. The soil is too wet for cultivated crops. Response to lime and fertilizer is moderate to good for pasture crops.

This soil is well suited to needleleaf trees. Soil-related management concerns include severe equipment limitations and seedling mortality in ponded areas. Species suitable for planting are slash pine and loblolly pine. Capability unit Vw–12; woodland suitability group 2w3.

Red Bay Series

The Red Bay series consists of deep, well-drained soils on uplands. These soils have slopes of 0 to 12 percent. They formed in marine deposits of unconsolidated sandy clay loam. Elevations range from 200 to 300 feet.

In a representative profile the surface layer is 6 inches of dark reddish-brown sandy loam. The subsoil is sandy clay loam throughout. The upper 10 inches is dark reddish brown, the next 64 inches is dark red, and the lower 10 inches is red.

Red Bay soils have moderate available water capacity. Permeability is moderately rapid in the surface layer and moderate in the subsoil. Organic-matter content and natural fertility are low. The native vegetation was a moderately dense stand of mixed hardwoods and pines. Nearly all of the acreage has been cleared and is used for row crops, pasture, and hay.

Representative profile of Red Bay sandy loam, 5 to 8 percent slopes, 3 miles northwest of Hartford in the NW¼NE¼NW¼ sec. 28, T. 2 N., R. 24 E., in pasture:

Ap—0 to 6 inches, dark reddish-brown (5YR 3/2) sandy loam; weak, fine, granular structure; very friable; common fine roots; strongly acid; abrupt, smooth boundary.

B21t—6 to 16 inches, dark reddish-brown (2.5YR 3/4) sandy clay loam; weak, medium, subangular blocky structure; friable; thin, nearly continuous clay films on faces of peds; strongly acid; clear, smooth boundary.

B22t—16 to 80 inches, dark-red (2.5YR 3/6) sandy clay loam; weak, medium, subangular blocky structure; friable; thin, nearly continuous clay films on faces of peds; strongly acid; gradual, wavy boundary.

B23t—80 to 90 inches, red (2.5YR 4/8) sandy clay loam; weak, medium, subangular blocky structure; friable; thin, nearly continuous clay films on faces of peds; strongly acid.

The Ap horizon is dark-brown or dark reddish-brown sandy loam or loamy sand. The B1 horizon, where present, is dark reddish-brown, dusky-red, or dark-red sandy loam. The B2t horizon is dark reddish brown, dusky red, or dark red. It dominantly is sandy clay loam but ranges to sandy loam. Reaction is medium acid to strongly acid in the A horizon and strongly acid in the B horizon. Iron concretions are less than 5 percent throughout.

Red Bay soils are adjacent to, and have a redder B horizon than, Lucy, Orangeburg, and Troup soils. Red Bay soils have a thinner A horizon than Lucy soils.

Red Bay sandy loam, 0 to 2 percent slopes (RbA).—This soil is on moderate to broad ridgetops. The profile

of this soil is similar to the one described as representative of the series, but the surface layer is 2 to 3 inches thicker.

Included with this soil in mapping are soils that have slopes of more than 2 percent and small areas of Dothan, Lucy, and Orangeburg soils. Also included are soils that have red colors at a depth of more than 40 inches.

This soil is well suited to all crops commonly grown in the county. Corn, peanuts, soybeans, grain sorghum, small grain, truck crops, bahiagrass, and Coastal bermudagrass are the main crops. Response to lime and fertilizer is good. The hazard of erosion is slight. Cultivated row crops can be grown each year when good management practices are used. Crop residues should be returned to the soil.

This soil is better suited to needleleaf trees than to most other uses. There are no soil-related management concerns. Species suitable for planting are slash pine, loblolly pine, and longleaf pine. Capability unit I–12; woodland suitability group 2o1.

Red Bay sandy loam, 2 to 5 percent slopes (RbB).—This soil is on moderate to broad ridgetops and side slopes. The profile of this soil is similar to the one described as representative of the series, but the surface layer is 1 to 3 inches thicker.

Included with this soil in mapping are soils that have slopes of less than 2 percent and soils that have slopes of more than 5 percent. Also included are some areas of Dothan, Lucy, and Orangeburg soils.

Corn, peanuts, grain sorghum, soybeans, small grain, truck crops, bahiagrass, and Coastal bermudagrass are commonly grown on this soil. Response to lime and fertilizer is good. The hazard of erosion is slight to moderate. Such effective erosion-control practices as contour farming, grassed waterways, contour stripcropping, terraces, and minimum tillage are needed when this soil is used for cultivated crops. Conservation cropping systems should use a close-growing crop about 1 year out of 2. Crop residues should be returned to the soil to help maintain organic-matter content and good tilth. When residue is removed following harvest of such crops as peanuts, a cover crop is needed.

This soil is better suited to needleleaf trees than to most other uses. There are no soil-related management concerns. Species suitable for planting are slash pine, loblolly pine, and longleaf pine. Capability unit IIe–12; woodland suitability group 2o1.

Red Bay sandy loam, 5 to 8 percent slopes (RbC).—This soil is on narrow to moderately wide side slopes. It has the profile described as representative of the series.

Included with this soil in mapping are soils that have slopes of less than 5 percent and soils that have slopes of more than 8 percent. Also included are a few small areas of Dothan, Lucy, Orangeburg, and Troup soils.

Corn, peanuts, grain sorghum, soybeans, small grain, bahiagrass, and Coastal bermudagrass are commonly grown on this soil. Response to lime and fertilizer is good. The hazard of erosion is moderate. Such effective erosion-control practices as contour farming, contour stripcropping, grassed waterways, terraces, diversions, and minimum tillage are needed when this soil is used for cultivated crops. Waterways are difficult to establish and maintain where runoff is concentrated (fig. 11). Cropping systems should use close-growing perennial sod about 3 years out of 5. Crop residue should be returned to the soil to help maintain organic-matter content and good tilth. When residue is removed following harvest of such crops as peanuts, a cover crop is needed.

This soil is better suited to needleleaf trees than to most other uses. There are no soil-related management concerns. Species suitable for planting are slash pine, loblolly pine, and longleaf pine. Capability unit IIIe–12; woodland suitability group 2o1.

Red Bay loamy sand, 8 to 12 percent slopes (RsD).—This soil is on narrow to moderately broad side slopes. The profile of this soil is similar to the one described as representative of the series, but the surface layer is 1 to 3 inches thicker.

Included with this soil in mapping are soils that have slopes of less than 8 percent and soils that have slopes of more than 12 percent. Also included are some small areas of Lucy, Orangeburg, and Troup soils.

Most areas of this soil are used for woodland. The soil is suited to Coastal bermudagrass and bahiagrass. Response to lime and fertilizer is good. Cultivated row crops are not commonly grown because slopes are steep and the hazard of erosion is severe. If cultivated crops are grown, they should be grown in a long, grass-based cropping system not more than 1 year in 5. Tillage operations should be on the contour.

This soil is better suited to needleleaf trees than to most other uses. There are no soil-related management concerns. Species suitable to planting are slash pine, loblolly pine, and longleaf pine. Capability unit IVe–12; woodland suitability group 2o1.

Troup Series

The Troup series consists of deep, well-drained soils on uplands. These soils have slopes of 0 to 12 percent. They formed in marine deposits of unconsolidated sandy loam and sandy clay loam. Elevations range from 100 to 200 feet.

In a representative profile the surface layer is 8 inches of brown loamy sand. The upper 20 inches of the subsurface layer is brown loamy sand, and the lower 28 inches is strong-brown sand. The subsoil is 24 inches of yellowish-red sandy loam.

Troup soils have low available water capacity. Permeability is moderately rapid in the surface layer and moderate in the subsoil. Organic-matter content and natural fertility are low. The native vegetation was a moderately dense stand of mixed hardwoods and pines. About half of the acreage has been cleared and is used for pasture, hay, and some row crops.

Representative profile of Troup loamy sand, 0 to 5 percent slopes, 5 miles west-northwest of Geneva in the NW¼SE¼NW¼ sec. 10, T. 1 N., R. 21 E., in idle pasture:

Ap—0 to 8 inches, brown (10YR 4/3) loamy sand; single grained; loose; common fine roots; very strongly acid; abrupt, smooth boundary.

Figure 11.—Severe gullying on Red Bay sandy loam, 5 to 8 percent slopes. Large gullies develop when runoff is not controlled.

A21—8 to 28 inches, brown (7.5YR 4/4) loamy sand; single grained; loose; very strongly acid; gradual, smooth boundary.

A22—28 to 56 inches, strong-brown (7.5YR 5/6) sand that has few, fine, distinct mottles of very pale brown (10YR 7/4); single grained; loose; very strongly acid; gradual, wavy boundary.

B2t—56 to 80 inches, yellowish-red (5YR 4/8) sandy loam; weak, fine, subangular blocky structure; very friable; strongly acid; gradual, wavy boundary.

The Ap horizon is brown, yellowish brown, or pale brown. The A2 horizon is brown, yellowish-brown, brownish-yellow, strong-brown, or yellowish-red loamy sand or sand. The B2t horizon is yellowish-red or red sandy loam or sandy clay loam. Reaction is very strongly acid in the A horizon and strongly acid or very strongly acid in the B horizon.

Troup soils are adjacent to Alaga, Bonifay, Lucy, Orangeburg, and Red Bay soils. Troup soils are not so sandy throughout as Alaga soils. They do not have plinthite in the B horizon, and Bonifay soils commonly do. Troup soils have a thicker sandy A horizon than Orangeburg and Red Bay soils.

Troup loamy sand, 0 to 5 percent slopes (TrB).—This soil is on moderately broad to broad ridgetops and side slopes. It has the profile described as representative of the Troup series.

Included with this soil in mapping are soils that have slopes of more than 5 percent and a few areas of Alaga, Bonifay, Lucy, Orangeburg, and Red Bay soils.

This soil is suited to bahiagrass and Coastal bermudagrass. Some areas are used for corn and peanuts, but these crops are generally affected by droughtiness. Such effective erosion-control practices as contour farming, crop residue management, grassed waterways, and cropping systems that include perennial sod are needed when this soil is used for cultivated crops. The hazard of erosion is light. Response to lime and fertilizer is moderate. Leaching of plant nutrients is a concern, and split applications of fertilizer are generally beneficial.

This soil is well suited to needleleaf trees. Soil-related management concerns include moderate seedling mortality and slight to moderate equipment restrictions. Species suitable for planting are loblolly pine,

slash pine, and longleaf pine. Capability unit IIIs–14; woodland suitability group 3s2.

Troup loamy sand, 5 to 12 percent slopes (TrC).—This soil is on narrow to moderately broad side slopes. The profile of this soil is similar to the one described as representative of the series, but the surface layer is 3 to 12 inches thinner.

Included with this soil in mapping are soils that have slopes of less than 5 percent and soils that have slopes of more than 12 percent. Also included are some small areas of Alaga, Bonifay, Lucy, Orangeburg, and Red Bay soils.

This soil is used mainly for woodland. Coastal bermudagrass and bahiagrass are suited pasture crops. A few areas where the soil is less sloping are used for corn and peanuts, but the soils are poorly suited to cultivated crops because of droughtiness. The soil should not be used for cultivated crops more than 1 year out of 4. Tillage operations should always be on the contour. Response to lime and fertilizer is moderate to low. Leaching of plant nutrients is a concern, and split applications of fertilizer are generally beneficial. Deep, caving gullies are common where concentrated runoff moves across the soil. Grassed waterways are very difficult to establish and maintain.

This soil is well suited to needleleaf trees. Soil-related management concerns include moderate seedling mortality and slight to moderate equipment restrictions. Species suitable for planting are loblolly pine, slash pine, and longleaf pine. Capability unit IVs-14; woodland suitability group 3s2.

Use and Management of the Soils

This section contains information about the use and management of the soils of Geneva County for crops and pasture, woodland, wildlife habitat, engineering, and town and country planning. It explains the system of capability classification used by the Soil Conservation Service and gives estimated yields of the principal crops grown in the county under a high level of management.

This section also groups the soils according to their suitability for woodland sites and for wildlife habitat. It contains a table that gives ratings of the soils for town and country planning and a subsection that gives significant information about soils when they are used for engineering purposes. Information about management is given in the section "Descriptions of the Soils."

Management for Crops and Pasture [2]

Clean-tilled cultivation of crops exposes the soil to the forces of striking raindrops and runoff. The striking raindrops dislodge tiny soil particles, and runoff removes these small particles from the field. The erosion process is selective. Large amounts of organic matter and the finer textured soil particles are lost during the early period of a rainstorm. These soil components are most important in providing good tilth, available water capacity, and available plant nutrients. Good management practices that result in rapid growth of crops also provide some protection against soil erosion, increase the amount of crop residue to be returned to the soil, and improve crop yields.

Some good management practices follow:

1. Lime and fertilizer.—Proper rates and analysis of fertilizer and lime are needed to produce good crop growth. Fertilizer and lime needs should always be determined by soil testing.
2. Crop varieties.—Those varieties that have been tested and recommended for the area by the Auburn University Experiment Station should be used.
3. Seedbed preparation.—Seedbeds should be adequately prepared for the crop to be grown. If seedbeds are prepared too far in advance of planting, excessive soil erosion results.
4. Planting.—Crops should be planted by a suitable method, at the proper rate, and at the right time.
5. Weed, insect, and disease control.—Controlling crop pests is essential to growing strong, healthy plants.

Conservation practices should be specifically planned for the soil and the sequence of crops to be grown. Nearly level soils do not require extensive application of conservation practices; however, sloping soils generally require several conservation measures to effectively reduce erosion and runoff water.

Some of the most common practices used on sloping soils on uplands follow:

1. Conservation cropping system or crop rotation.—Cropping systems that include the use of close-growing annual crops or perennial sod crops are very effective in reducing erosion, runoff, and concerns of crop pests and result in increased crop yields.
2. Contour farming.—Contour rows and tillage operations result in much slower movement of runoff. This gives the water more time to be absorbed by the soil.
3. Minimum tillage.—Reducing the number of tillage operations results in less compaction. Minimum tillage practices that are performed by preparing a narrow seedbed and leaving residue on the surface are very effective in reducing erosion and runoff.
4. Terraces.—Properly constructed terraces are effective in reducing erosion. Well-established grassed waterways or disposal areas are needed for safe disposal of water at terrace outlets. A terrace system that utilizes underground tile outlets is needed where waterways are difficult to establish and maintain.
5. Contour stripcropping.—Alternate strips of cultivated crops and close-growing crops that follow the contour are very effective in controlling erosion and runoff.
6. Grassed waterways.—Natural drains or constructed outlets need to be established to and

[2] LEWIS D. WILLIAMS, conservation agronomist, Soil Conservation Service, helped prepare this section.

maintained in perennial, sod-forming grass. Well-established waterways will prevent gullies from forming on areas where concentrated runoff water leaves the field.

7. Crop residue management.—Crop residues should be shredded and left on the surface until the soil is prepared for the next crop.
8. Cover crops.—Soils that are left bare after harvest should be planted to cover crops to prevent erosion and provide residue to be returned to the soil.

Several pasture and hay practices that apply to all soils that are used for grasses include: proper grazing or cutting heights, weed control, proper fertilization as indicated by soil test, rotational grazing, and scattering droppings. Overgrazing and low fertilization result in weak plants and poor stands that are quickly infested with weeds.

Capability grouping

Some readers, particularly those who farm on a large scale, find it practical to use and manage similarly some of the different kinds of soil on their farm. These readers can make good use of the capability classification system, a grouping that shows, in a general way, the suitability of soils for most kinds of farming.

The grouping is based on permanent limitations of soils when they are used for crops, the risk of damage when they are farmed, and the way they respond to treatment. The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils; does not take into consideration possible but unlikely major reclamation projects; and does not apply to rice, cranberries, horticultural crops, or other crops that require special management.

Those familiar with the capability classification can infer from it much about the behavior of soils when used for other purposes, but this classification is not a substitute for interpretations designed to show suitability and limitations for range, forest trees, or engineering.

In the capability system, all kinds of soil are grouped at three levels: the class, the subclass, and the unit. The broadest grouping, the capability class, is designated by Roman numerals I to VIII. In class I are the soils that have the fewest limitations, the widest range of use, and the least risk of damage when they are used. The soils in the other classes have progressively greater natural limitations. In class VIII are soils and landforms so rough, shallow, or otherwise limited that they do not produce worthwhile yields of crops, forage, or wood products. The subclass indicates major kinds of limitations within the classes.

Within each class can be as many as four subclasses. The subclasses are indicated by adding a small letter, *e*, *w*, *s*, or *c*, to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* means that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c* indicates that the chief limitation is climate that is too cold or too dry.

In class I there are no subclasses, because the soils of this class have few or no limitations. Class V can contain, at the most, only subclasses *w*, *s*, and *c*, because the soils are subject to little or no erosion but have other limitations that restrict their use largely to pasture, range, or wildlife.

Subclasses are further divided into groups called capability units. These are groups of soils that are so much alike that they are suited to the same crops and pasture plants, they require about the same management, and they have generally similar productivity and other responses to management. Capability units are generally identified by numbers assigned locally, for example, IIe–12 or IIIs–14.

The eight classes in the capability system and the subclasses and units in Geneva County are described in the list that follows. The unit designation for each soil is given in the "Guide to Mapping Units."

Class I soils have few limitations that restrict their use (no subclasses).

- Capability unit I–12. Deep, nearly level, well-drained soils that have a loamy surface layer and subsoil; on uplands.
- Capability unit I–16. Deep, nearly level, well-drained soils that have a sandy surface layer and a loamy subsoil underlain by sand; on stream terraces.

Class II soils have moderate limitations that reduce the choice of plants or require moderate conservation practices.

- Subclass IIe soils are subject to moderate erosion unless protected.
  - Capability unit IIe–12. Deep, gently sloping, well drained or moderately well drained soils that have a loamy surface layer and subsoil; on uplands.
- Subclass IIw soils are moderately limited because of excess water.
  - Capability unit IIw–12. Deep, nearly level, somewhat poorly drained soils that have a loamy surface layer and subsoil; on uplands.
  - Capability unit IIw–15. Deep, nearly level, moderately well drained soils that have a loamy surface layer and subsoil; on stream terraces.
- Subclass IIs soils have slight restrictions in permeability or moderate limitations in available water capacity.
  - Capability unit IIs–12. Deep, nearly level, well drained or moderately well drained soils that have a loamy surface layer and subsoil; on uplands.
  - Capability unit IIs–14. Deep, nearly level to gently sloping, slightly droughty soils that have a sandy surface layer and a loamy subsoil; on uplands.

Class III soils have severe limitations that reduce the choice of plants, require special conservation practices, or both.

Subclass IIIe soils are subject to severe erosion if they are cultivated and not protected.

Capability unit IIIe–11. Deep, gently sloping, well drained or moderately well drained soils that have a sandy surface layer and a clayey subsoil; on uplands.

Capability unit IIIe–12. Deep, sloping, well drained or moderately well drained soils that have a loamy surface layer and subsoil; on uplands.

Subclass IIIs soils have severe limitations because of low available water capacity.

Capability unit IIIs–14. Deep, nearly level and gently sloping, well-drained to excessively drained soils that have a sandy surface layer more than 40 inches thick; on uplands and stream terraces.

Class IV soils have very severe limitations that reduce the choice of plants, require very careful management, or both.

Subclass IVe soils are subject to very severe erosion if they are cultivated and not protected.

Capability unit IVe–11. Deep, sloping and strongly sloping, well drained or moderately well drained soils that have a sandy surface layer and a clayey subsoil; on uplands.

Capability unit IVe–12. Deep, strongly sloping, well-drained soils that have a sandy surface layer and a loamy subsoil; on uplands.

Subclass IVw soils are very severely limited because of excess water.

Capability unit IVw–11. Deep, nearly level, poorly drained and somewhat poorly drained soils that have a loamy surface layer and a clayey subsoil and that have a high water table; on stream terraces.

Capability unit IVw–14. Deep, nearly level, poorly drained soils that have a thick sandy surface layer and a loamy subsoil; on uplands and stream terraces.

Subclass IVs soils are very severely limited because of low available water capacity.

Capability unit IVs–14. Deep, excessively drained and well-drained, nearly level to strongly sloping soils that have a sandy surface layer more than 40 inches thick; on stream terraces and uplands.

Class V soils are subject to little or no erosion but have other limitations, impractical to remove, that limit their use largely to woodland, wildlife habitat, or pasture.

Subclass Vw soils are too wet for cultivation; drainage or protection is not feasible.

Capability unit Vw–11. Deep, nearly level, poorly drained soils that have a loamy surface layer and a clayey subsoil; subject to ponding; in depressions on uplands.

Capability unit Vw–12. Deep, nearly level, poorly drained soils that have a loamy surface layer and subsoil; on uplands.

Capability unit Vw–13. Deep, nearly level, poorly drained or very poorly drained soils that have a loamy surface layer and a sandy, loamy, and clayey subsoil; subject to frequent flooding; on stream terraces and flood plains.

Class VI soils have severe limitations that make them generally unsuited to cultivation and limit their use largely to pasture, woodland, or wildlife habitat. (None of the soils in Geneva County have been placed in Class VI.)

Class VII soils have very severe limitations that make them unsuited to cultivation and restrict their use largely to woodland or wildlife food and cover.

Subclass VIIw soils have very severe limitations because of excess water.

Capability unit VIIw–11. Deep, nearly level to depressional, very poorly drained soils that are ponded and that have a loamy surface layer and a clayey subsoil; on uplands.

Class VIII soils and landforms have limitations that preclude their use for commercial crop production and restrict their use to recreation, wildlife habitat, water supply, or esthetic purposes. (None of the soils in Geneva County have been placed in Class VIII.)

Estimated yields

Table 2 shows estimated yields of the principal crops grown in Geneva County under a high level of management. Yields depend chiefly on tilth and fertility and on a sufficient supply of moisture at the time of planting and throughout the growing season. Consistently favorable yields indicate that fertility has been kept high, good tilth has been maintained, and rainwater has been held and stored in the soil.

At a high level of management, soil-improving crops, cover crops, and crops that leave a large amount of residue is grown in the rotation; crop residue is kept on the surface to help control erosion; water is conserved by using all the practices needed, including terraces and contour farming; and fertilizer is applied according to crop requirements and soil tests. Under high-level management, farming operations are carried out at the best possible time. Terraces and waterways are well maintained; crop residue is used to improve tilth as well as to control erosion; and a good program is followed for controlling insects.

Use of the Soils for Woodland [3]

Originally, Geneva County was mainly wooded. Now trees cover about 43 percent of the county.

Good stands of commercial trees are produced in the woodlands of the county. Needleleaf trees are most abundant on uplands, and broadleaf trees generally predominate on the bottoms along the rivers and creeks.

The value of wood products is substantial, although it is below its potential. Woodland is also valuable for grazing, wildlife, recreation, natural beauty, and conservation of soil and water.

This section describes how soils affect tree growth and management in the county. In table 3 the soils are placed in woodland suitability groups, and some of the

[3] WILLIAM C. AIKEN, woodland conservationist, Soil Conservation Service, helped prepare this section.

TABLE 2.—*Estimated average yields per acre of the principal crops under high-level management*

[Absence of figure indicates that the crop is not commonly grown on the soil or that no data are available for estimates]

Soil	Corn	Peanuts	Soybeans	Grain sorghum	Wheat	Tomatoes	Pasture		Coastal bermudagrass hay
							Bahiagrass	Coastal bermudagrass	
	Bu	*Lb*	*Bu*	*Bu*	*Bu*	*Bu*	*AUM* [1]	*AUM* [1]	*Tons*
Alaga loamy sand, 0 to 5 percent slopes	55	1,800				140	7.0	7.5	5.0
Alpin sand, 0 to 3 percent slopes		1,800					6.5	7.5	4.0
Ardilla sandy loam, 0 to 2 percent slopes	80		45				7.0	8.0	5.5
Bibb and Osier soils, frequently flooded							7.0		
Bigbee-Kalmia-Eunola association									
Bonifay loamy sand, 0 to 5 percent slopes	50	1,600	25				6.5	6.5	4.0
Byars soils, ponded									
Chastain and Bibb soils							7.0		
Dothan sandy loam, 0 to 2 percent slopes	85	2,300	45	35	40	170	8.0	9.0	5.5
Dothan sandy loam, 2 to 5 percent slopes	75	2,200	45	35	40	165	8.0	9.0	5.5
Dothan sandy loam, 5 to 8 percent slopes	65	1,800	40	30	35	145	6.0	8.0	5.0
Esto loamy sand, 2 to 5 percent slopes	50	1,700	35				5.8	6.0	4.0
Esto loamy sand, 5 to 12 percent slopes							5.5	5.8	3.8
Eunola sandy loam	100		35				7.0	8.0	5.0
Fuquay loamy sand, 1 to 5 percent slopes	85	2,700	30	30	35	150	7.0	8.5	5.0
Grady silt loam									
Kalmia loamy sand, 0 to 3 percent slopes	100	2,500	45	40	50		8.5	10.5	5.4
Leaf-Lenoir complex							9.0	10.0	
Lucy loamy sand, 0 to 5 percent slopes	75	2,800	30	30	35	160	8.0	8.5	5.0
Orangeburg sandy loam, 0 to 2 percent slopes	95	3,500	45	35	40	180	8.5	10.5	6.5
Orangeburg sandy loam, 2 to 5 percent slopes	90	3,200	45	35	40	170	8.5	10.5	6.5
Orangeburg sandy loam, 5 to 8 percent slopes	80	2,800	35	30	35		8.0	10.0	6.0
Plummer loamy sand							5.0	6.0	
Rains sandy loam							6.5		6.5
Red Bay sandy loam, 0 to 2 percent slopes	85	3,500	45	35	40	200	9.5	10.0	6.5
Red Bay sandy loam, 2 to 5 percent slopes	80	3,200	45	35	40	190	9.0	10.0	6.5
Red Bay sandy loam, 5 to 8 percent slopes	80	2,800	40	30	35		9.0	9.0	6.0

TABLE 2.—*Estimated average yields per acre of the principal crops under high-level management*—Continued

[Absence of figure indicates that the crop is not commonly grown on the soil or that no data are available for estimates]

Soil	Corn	Peanuts	Soybeans	Grain sorghum	Wheat	Tomatoes	Pasture		Coastal bermudagrass hay
							Bahiagrass	Coastal bermudagrass	
	Bu	*Lb*	*Bu*	*Bu*	*Bu*	*Bu*	*AUM* [1]	*AUM* [1]	*Tons*
Red Bay loamy sand, 8 to 12 percent slopes							8.5	8.5	5.5
Troup loamy sand, 0 to 5 percent slopes	55	2,200					7.2	7.5	4.0
Troup loamy sand, 5 to 12 percent slopes	50	1,600					6.5	7.0	3.0

[1] Animal-unit-months is a term used to express the carrying capacity of a pasture. It is the number of months that 1 acre will provide grazing for one animal unit (1,000 pounds live weight).

TABLE 3.—*Potential productivity of the soils for tree growth*

Woodland suitability group, descriptions, and soil symbols	Important trees	Average site index	Yearly growth rate per acre		Trees to plant
			Board feet	*Cords*	
2o1: Nearly level to strongly sloping, well drained or moderately well drained soils that have a loamy and sandy surface layer and a loamy subsoil; on uplands. DoA, DoB, DoC, OrA, OrB, OrC, RbA, RbB, RbC, RsD.	Slash pine	90	590	1.7	Slash pine, loblolly pine, longleaf pine.
	Loblolly pine	90	590	1.8	
	Longleaf pine	70	390	.9	
2o7: Nearly level, well-drained soils that have a sandy surface layer and a loamy subsoil; on stream terraces. BK (Kalmia part), KaA.	Loblolly pine	90	590	1.8	Loblolly pine, slash pine, yellow-poplar, sweetgum, cottonwood.
	Slash pine	90	590	1.7	
	Sweetgum	80	290	1.1	
	Yellow-poplar	90	410	1.3	
	Oaks	90	290	1.3	
2w3: Nearly level, poorly drained soils that have a loamy and sandy surface layer and a loamy subsoil; on uplands and stream terraces. Pm, Ra.	Slash pine [1]	90	590	1.7	Slash pine, loblolly pine.
	Loblolly pine [1]	90	590	1.8	
	Longleaf pine [1]	70	390	.9	
	Tupelos				
	Sweetgum	90	344	1.5	
2w8: Nearly level, moderately well drained and somewhat poorly drained soils that have a loamy surface layer and a loamy subsoil; on uplands and stream terraces. ArA, BK (Eunola part), Eu.	Slash pine	90	590	1.7	Slash pine, loblolly pine, sycamore, sweetgum, yellow-poplar, cottonwood.
	Loblolly pine	90	590	1.8	
	Longleaf pine	75		1.0	
	Sweetgum	90	400	1.5	
	Red oak	90	290	1.3	
2w9: Nearly level, somewhat poorly drained and poorly drained soils that have a loamy surface layer and a sandy, loamy, or clayey subsoil; on uplands, stream terraces, and flood plains. Bb, CB, Gr, Le.	Sweetgum [1]	90	400	1.5	Loblolly pine [1], slash pine [1], sycamore [1], cottonwood [1].
	Loblolly pine [1]	90	590	1.8	
	Slash pine [1]	90	590	1.7	
	Water oak				
	Red oak				
	Tupelos				
3o1: Gently sloping to strongly sloping, well-drained or moderately well drained soils that have a sandy surface layer and a clayey subsoil; on uplands. EsB, EsC.	Loblolly pine	80	470	1.3	Loblolly pine, slash pine.
	Slash pine	80	470	1.3	
	Longleaf pine	70	390	.9	

TABLE 3.—*Potential productivity of the soils for tree growth*—Continued

Woodland suitability group, descriptions, and soil symbols	Important trees	Average site index	Yearly growth rate per acre		Trees to plant
			Board feet	*Cords*	
3s2: Nearly level to strongly sloping, well-drained to excessively drained soils that have a sandy surface layer and a sandy or loamy subsoil; on uplands and stream terraces. AaB, ApA, BoB, FuB, LuB, TrB, TrC.	Loblolly pine Slash pine Longleaf pine	80 80 70	470 470 390	1.3 1.3 .9	Loblolly pine, slash pine, longleaf pine.
2s2: Nearly level, excessively drained soil that has a sandy surface layer and a sandy subsurface layer; on stream terraces. BK (Bigbee part).	Loblolly pine	90	590	1.8	Loblolly pine, slash pine.
4w3: Nearly level, very poorly drained soil that has a loamy surface layer and a clayey subsoil; on uplands. By.	Water tupelo Sweetgum	90 90			Water tupelo, sweetgum.

[1] In areas where surface drainage is adequate.

preferred timber species and their average site indexes and yearly growth rates per acre are shown.

The soils of Geneva County have been placed in woodland suitability groups to assist owners in planning the use of their soil for wood crops. Each group is made up of soils that are suited to the same kinds of trees; that need approximately the same kind of management when the vegetation on them is similar; and that have about the same potential productivity.

Each woodland group is identified by a three-part symbol, such as 2w3, 3o1, or 4s3. The first part of the symbol, always a number, indicates relative potential productivity of the soils in the group: 1 = very high; 2 = high; 3 = moderately high; 4 = moderate; and 5 = low. These ratings are based on field observations of average site index. Site index is the height, in feet, that the dominant trees of a given species on a specified kind of soil reach in a natural, unmanaged stand in a stated number of years. For the merchantable hardwoods and softwoods in this county, the site index is the height reached in 50 years, except for cottonwood, for which the index is height reached in 30 years.

The five ratings are based on field determination of average site index of an indicator forest type or species. Site indexes are grouped into site quality classes, and the classes are used to arrive at approximate expected yields per acre in cords and board feet. On basis of research studies, site index can be converted into approximate expected growth and yield per acre in cords and board feet. For this survey, conversions of average site index into volumetric growth and yield are based on United States Department of Agriculture research on loblolly and shortleaf pines (*4*), cottonwood (*7*), and oaks (*6*).

The second part of the symbol identifying a woodland group is a small letter. This letter indicates an important soil property that imposes a slight to severe hazard or limitation in managing the soils of the group for wood crops. A letter *c* shows that the main limitation is the kind or amount of clay in the upper part of the soils in the group; *o* shows that the soils have few limitations that restrict their use for trees; *r* shows that the main limitation is steep slopes; *s* shows that the soils are sandy and dry, have little or no difference in texture between surface layer and subsoil (or B horizon), have low available water capacity, and generally have a low supply of plant nutrients; *w* shows that water in or on the soil, either seasonally or year round, is the chief limitation.

The third part of the symbol is a number that indicates degree of hazard or limitation and general suitability of the soils for certain kinds of trees.

The numeral 1 indicates soils that have no limitations or only slight limitations and that are best suited to needleleaf trees.

The numeral 2 indicates soils that have one or more moderate limitations and that are best suited to needleleaf trees.

The numeral 3 indicates soils that have one or more severe limitations and that are best suited to needleleaf trees.

The numeral 4 indicates soils that have no limitations or only slight limitations and that are best suited to broadleaf trees.

The numeral 5 indicates soils that have one or more moderate limitations and that are best suited to broadleaf trees.

The numeral 6 indicates soils that have one or more severe limitations and that are best suited to broadleaf trees.

The numeral 7 indicates soils that have no limitations or only slight limitations and that are suited to either needleleaf or broadleaf trees.

The numeral 8 indicates soils that have one or more moderate limitations and that are suited to either needleleaf or broadleaf trees.

The numeral 9 indicates soils that have one or more severe limitations and that are suited to either needleleaf or broadleaf trees.

The numeral 0 indicates that the soils are not suitable for producing timber commercially.

The hazards or limitations that affect management of soils for woodland are windthrow hazard, erosion hazard, equipment limitations, seedling mortality, and plant composition.

To facilitate management, the soils of Geneva County have been placed in woodland suitability groups. Management of the soils for trees is given in the descriptions of the mapping units.

Windthrow hazard measures the effect of the soils on root development and the ability of the soil to hold trees firmly. The hazard is slight where effective rooting is more than 20 inches and the tree withstands most wind; moderate where effective rooting is 10 to 20 inches and some trees are blown down during periods of excessive soil wetness and strong wind; and severe where effective rooting is 10 inches or less and trees will not stand in strong wind.

Erosion hazard refers to the potential hazard of soil losses in well-managed woodland. The hazard is slight if expected soil losses are small; moderate if some soil losses are expected and care is needed during logging and construction to reduce soil losses; severe if special methods of operation are necessary for preventing excessive soil losses. In Geneva County only the steep soils are subject to severe erosion.

Equipment limitations are rated on basis of soil characteristics that restrict or prohibit the use of equipment commonly used in tending and harvesting the trees. In Geneva County soil characteristics having the most limiting effect are drainage, depth to the water table, slope, and texture of the surface layer. Slight means there is no restriction in the kind of equipment or in the time of year it is used; moderate means that use of equipment is restricted part of the year but for a period less than 3 months; and severe means that special equipment is needed and its use is restricted for more than 3 months of the year.

Seedling mortality refers to the expected degree of mortality of planted seedlings as influenced by kinds of soil when plant competition is not a limiting factor. Considered in the ratings are depth to the water table, hazard of flooding, drainage, soil depth, soil structure, and degree of erosion. Normal rainfall, good planting stock, and proper planting are assumed. A rating of slight indicates an expected loss of less than 25 percent of the planted seedlings; moderate, a loss of 25 to 50 percent of the seedlings; and severe, a loss of more than 50 percent of the seedlings. Special preparation of the site is needed before planting on soils rated severe and on most soils rated moderate.

Plant competition is rated on the basis of the degree to which unwanted plants invade openings in the tree canopy. Considered in the ratings are available water capacity, fertility, drainage, and degree of erosion. A rating of slight means that competition from other plants is not a concern; moderate, that plant competition delays development of fully stocked stands of desirable trees; and severe, that plant competition prevents establishment of a desirable stand unless intensive site preparation and such practices as weeding are used to control undesirable plants.

Interpretations of the Soils for Wildlife Habitat [4]

The wildlife population of any area depends upon the availability of food, cover, and water in suitable combinations. Habitats are retained or created and maintained by establishing desirable vegetation and by developing water supplies in suitable places.

In table 4 each of the soils in Geneva County is rated good, fair, poor, or very poor according to its suitability for the elements that comprise wildlife habitat and also its suitability for producing habitat for openland, woodland, and wetland wildlife. The ratings refer to only the suitability of the soil. They do not take into account present land use or the distribution and density of wildlife and human populations. The suitability of individual sites must be determined by onsite inspection.

Grain and seed crops are domestic grain or other seed-producing annuals that are commonly planted to produce food for wildlife. Examples are corn, sorghum, wheat, oats, barley, millet, cowpeas, soybeans, and sunflower.

Domestic grasses and legumes are perennial grasses and herbaceous legumes that are commonly planted to produce food or cover or both for wildlife. Examples are fescue, lovegrass, orchardgrass, clovers, alfalfa, and vetches.

Wild herbaceous plants are native or naturally established dryland herbaceous grasses and forbs (including weeds) that provide either food or cover or both for wildlife. Examples are goldenrod, beggarweed, milkpeas, ragweeds, partridgepea, pokeweed, crotons, fescues, and gramas.

Hardwood trees include nonconiferous trees and associated woody understory plants that either provide wildlife cover or produce nuts, buds, catkins, twigs, bark, or foliage used as food by wildlife.

Coniferous plants are cone-bearing trees, shrubs, or ground cover that furnish wildlife cover or supply food in the form of browse, seeds, or fruitlike cones. These plants are commonly established through natural processes, but they may be planted or transplanted. Examples are pines, cedar, and juniper.

Wetland plants are annual perennial wild herbaceous plants which grow on moist to wet sites. Submerged and floating aquatic plants are not included. These plants provide food or cover or both for wetland forms of wildlife. Examples are smartweed, wild millets, rushes, sedges, reeds, wildrice, cutgrass, cordgrass, and cattail.

Shallow-water areas are areas of surface water that are useful to wildlife. Their average depth is less than 5 feet. They may be natural wet areas or those created by dams, levees, or water-control devices in marshes or streams. Examples are muskrat marshes, waterfowl feeding areas, wildlife watering developments, wildlife ponds, and beaver ponds.

The ratings used in expressing the suitability of the soils for producing wildlife habitat are explained in the following paragraphs.

A rating of *good* means that habitats are easily improved, maintained, or created; that there are few or no soil limitations in habitat management; and that satisfactory results can be expected.

A rating of *fair* means that habitats can be improved, maintained, or created; that moderate soil limitations affect habitat management or development;

[4] ROBERT E. WATERS, biologist, helped prepare this section.

TABLE 4.—*Suitability of the soils for elements*

Soil series and map symbols	Elements of wildlife habitat			
	Grain and seed crops	Domestic grasses and legumes	Wild herbaceous plants	Hardwood trees
Alaga: AaB	Poor	Fair	Fair	Poor
Alpin: ApA	Poor	Fair	Fair	Poor
Ardilla: ArA	Fair	Good	Good	Good
Bibb: Bb For Osier part, see Osier series.	Poor	Fair	Fair	Fair
Bigbee: BK For Eunola and Kalmia parts, see Eunola and Kalmia series, respectively.	Poor	Fair	Fair	Poor
Bonifay: BoB	Poor	Fair	Fair	Poor
Byars: By	Very poor	Very poor	Very poor	Very poor
Chastain: CB For Bibb part, see Bibb series.	Poor	Fair	Fair	Fair
Dothan:				
DoA, DoB	Good	Good	Good	Good
DoC	Fair	Good	Good	Good
Esto:				
EsB	Good	Good	Good	Good
EsC	Fair	Good	Good	Good
Eunola: Eu	Good	Good	Good	Good
Fuquay: FuB	Poor	Fair	Good	Good
Grady: Gr	Poor	Fair	Fair	Fair
Kalmia: KaA	Good	Good	Good	Good
Leaf: Le For Lenoir part, see Lenoir series.	Poor	Fair	Fair	Fair
Lenoir Mapped only in complex with Leaf soils.	Fair	Good	Good	Good
Lucy: LuB	Poor	Fair	Good	Good
Orangeburg:				
OrA, OrB	Good	Good	Good	Good
OrC	Fair	Good	Good	Good
Osier Mapped only in an undifferentiated unit with Bibb soils.	Poor	Fair	Fair	Fair
Plummer: Pm	Poor	Fair	Fair	Fair
Rains: Ra	Very poor	Very poor	Very poor	Fair
Red Bay:				
RbA, RbB	Good	Good	Good	Good
RbC	Fair	Good	Good	Good
RsD	Fair	Good	Good	Good
Troup: TrB, TrC	Poor	Fair	Fair	Fair

and that moderate intensity of management and fairly frequent attention may be required to ensure satisfactory results.

A rating of *poor* means that habitats can be improved, maintained, or created; that soil limitations are severe; that habitat management may be difficult and expensive and may require intensive effort. Results are questionable.

A rating of *very poor* means that under the prevailing soil conditions, it is impractical to attempt to improve, maintain, or create habitats. Unsatisfactory results are probable.

of wildlife habitat and for kinds of wildlife

Elements of wildlife habitat—con.			Kinds of wildlife		
Coniferous plants	Wetland plants	Shallow-water areas	Openland	Woodland	Wetland
Poor	Very poor	Very poor	Fair	Poor	Very poor.
Fair	Very poor	Very poor	Fair	Fair	Very poor.
Good	Fair	Fair	Good	Good	Fair.
Fair	Good	Good	Fair	Fair	Good.
Good	Very poor	Very poor	Fair	Poor	Very poor.
Fair	Poor	Very poor	Fair	Poor	Very poor.
Very poor	Good	Good	Very poor	Very poor	Good.
Fair	Good	Good	Fair	Fair	Good.
Good	Poor	Poor	Good	Good	Poor.
Good	Poor	Poor	Good	Good	Poor.
Good	Poor	Very poor	Good	Good	Very poor.
Good	Very poor	Very poor	Good	Good	Very poor.
Good	Poor	Poor	Good	Good	Poor.
Good	Poor	Very poor	Fair	Good	Very poor.
Fair	Good	Good	Fair	Fair	Good.
Good	Poor	Very poor	Good	Good	Very poor.
Fair	Good	Good	Fair	Fair	Good.
Good	Fair	Fair	Good	Good	Fair.
Good	Poor	Very poor	Fair	Good	Very poor.
Good	Poor	Very poor	Good	Good	Very poor.
Good	Poor	Very poor	Good	Good	Very poor.
Fair	Good	Good	Fair	Fair	Good.
Fair	Fair	Good	Fair	Fair	Fair.
Fair	Good	Good	Very poor	Poor	Good.
Good	Poor	Very poor	Good	Good	Very poor.
Good	Poor	Very poor	Good	Good	Very poor.
Good	Poor	Very poor	Good	Good	Very poor.
Fair	Very poor	Very poor	Fair	Fair	Very poor.

Openland wildlife are birds and mammals of croplands, pastures, meadows, lawns, and areas overgrown with grasses, herbs, shrubs, and vines. Examples are bobwhite quail, meadowlark, field sparrow, killdeer, cottontail rabbit, mourning dove, and red fox.

Woodland wildlife are birds and mammals of wooded areas containing either hardwood trees or coniferous trees and shrubs, or a mixture of both. Examples are wild turkey, woodcock, thrushes, vireos, woodpeckers, squirrels, gray fox, raccoon, and white-tailed deer.

Wetland wildlife are birds and mammals of swampy, marshy, or open water areas. Examples are ducks,

geese, herons, shore birds, rails, kingfishers, muskrat, mink, beaver, and otter.

Engineering Uses of the Soils

This section is useful to those who need information about soils used as structural material or as foundation upon which structures are built. Among those who can benefit from this section are planning commissions, town and city managers, land developers, engineers, contractors, and farmers.

Among properties of soils highly important in engineering are permeability, strength, compaction characteristics, drainage condition, shrink-swell potential, grain size, plasticity, and reaction. Also important are depth to the water table and slope. These properties, in various degrees and combinations, affect construction and maintenance of roads, airports, pipelines, foundations for small buildings, irrigation systems, ponds and small dams, and systems for disposal of sewage and refuse.

Information in this section of the soil survey can be helpful to those who—

1. Select potential residential, industrial, commercial, and recreational areas.
2. Evaluate alternate routes for roads, highways, pipelines, and underground cables.
3. Seek sources of gravel, sand, or clay.
4. Plan farm drainage systems, irrigation systems, ponds, terraces, and other structures for controlling water and conserving soil.
5. Correlate performance of structures already built with properties of the kinds of soil on which they are built, for the purpose of predicting performance of structures on the same or similar kinds of soil in other locations.
6. Predict the trafficability of soils for cross-country movement of vehicles and construction of equipment.
7. Develop preliminary estimates pertinent to construction in a particular area.

Most of the information in this section is presented in tables 5, 6, 7, and 8, which show, respectively, engineering test data; several estimated soil properties significant in engineering; interpretations of soil properties for various engineering uses; and interpretations of the soils for use in town and country planning.

This information, along with the soil map and other parts of this publication, can be used to make interpretations in addition to those given in tables 7 and 8, and it also can be used to make other useful maps.

This information, however, does not eliminate the need for further investigations at sites selected for engineering works, especially works that involve heavy loads or that require excavations to depths greater than those shown in the tables, generally depths greater than 6 feet. Also, inspection of sites, especially small ones, is needed because many delineated areas of a given soil mapping unit may contain small areas of other kinds of soil that have strongly contrasting properties and different suitabilities or limitations for soil engineering.

Some of the terms used in this soil survey have special meaning in soil science and are not known to all engineers. The Glossary defines many of these terms.

TABLE 5.—*Engineering*

[Tests performed by Alabama State Highway

Soil name and location	Parent material	Report Number S71-Ala-31-	Depth	Moisture-density[1]	
				Maximum dry density	Optimum moisture
			Inches	*Pounds per cubic feet*	*Percent*
Esto loamy sand:					
7.5 miles N. of Geneva	Marine deposits of unconsolidated	4-1	0-8	118	10
SW1/4SW1/4NW1/4, sec. 16,	beds of sand and clay.	4-4	23-42	101	22
T. 2 N., R. 22 E. (Modal)		4-5	42-90	107	19
Fuquay loamy sand:					
6 miles ESE. of Geneva	Marine deposits of unconsolidated	3-1	0-9	114	10
SE1/4NE1/4NE1/4, sec. 19,	beds of sand and clay.	3-3	23-33	126	10
T. 7 N., R. 15 W. (Modal)		3-5	44-56	110	15
Troup loamy sand:					
5 miles WNW. of Geneva	Unconsolidated sandy marine	13-1	0-8	120	10
NE1/4SE1/4NW1/4, sec. 10,	sediment.	13-2	8-28	118	10
T. 1 N., R. 21 E. (Modal)		13-4	56-95	125	9

[1] Based on Moisture-density Relations of Soils Using 5.5-lb. Rammer and 12-in. Drop, AASHTO Designation T 99, Method A (*1*).

[2] Mechanical analyses according to the AASHTO Designation T 88. Results by this procedure frequently may differ somewhat from results that would have been obtained by the soil survey procedure of the Soil Conservation Service (SCS). In the AASHTO procedure, the fine material is analyzed by the hydrometer method and the various grain-sized fractions are calculated on the basis of all the material, including that coarser than 2 millimeters in diameter. In the SCS soil survey procedure, the fine material is

Engineering classification systems

The two systems most commonly used in classifying samples of soil for engineering are the Unified system (*2*) used by the SCS engineers, Department of Defense, and others, and the AASHTO system (*1*) adopted by the American Association of State Highway and Transportation Offiicals.

In the Unified system soils are classified according to particle size distribution, plasticity, liquid limit, and content of organic matter. Soils are grouped in 15 classes. There are eight classes of coarse-grained soils, identified as GW, GP, GM, GC, SW, SP, SM, and SC; six classes of fine-grained soils, identified as ML, CL, OL, MH, CH, and OH; and one class of highly organic soils, identified as Pt. Soils on the borderline between two classes are designated by symbols for both classes; for example, CL–ML.

The AASHTO system is used to classify soils according to those properties that affect use in highway construction and maintenance. In this system, a soil is placed in one of seven basic groups ranging from A–1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. In group A-1 are gravelly soils of high bearing strength, or the best soils for subgrade (foundation). At the other extreme, in group A-7, are clay soils that have low strength when wet and that are the poorest soils for subgrade. Where laboratory data are available to justify a further breakdown, the A–1, A–2, and A–7 groups are divided as follows: A–1–b, A–2–4, A–2–5, A–2–6, A–2–7, A–7–5, and A–7–6. As additional refinement, the engineering value of a soil material can be indicated by a group index number. Group indexes range from 0 for the best material to 20 or more for the poorest. The AASHTO classification for tested soils, with group index numbers in parentheses, is shown in table 5; the estimated classification, without group index numbers, is given in table 6 for soils mapped in the survey area.

Engineering test data

Samples of selected layers taken from three soil profiles representing three extensive soil series in Geneva County were tested in the laboratory of the Alabama State Highway Department, Bureau of Materials and Tests. Results of these tests are given in table 5. All samples were obtained at a depth of less than 8 feet. Therefore, the data presented in table 5 may not be adequate for estimating characteristics of soil material in deeper cuts.

Table 5 also gives compaction, or moisture-density, data for the tested soils. If soil material is compacted at successively higher moisture content, assuming that the compactive effort remains constant, the density of the compacted material increases until the optimum moisture content is reached. After that, the density decreases with increase in moisture content. The moisture content at which maximum dry density is obtained is the optimum moisture content. Moisture-density data are important in earthwork, for as a rule, optimum stability is obtained if the soil is compacted to about the maximum dry density when it is at approximately the optimum moisture content.

The engineering soil classifications given in table 5 are based on data obtained by mechanical analyses and

test data

Department, Bureau of Materials and Tests]

Mechanical analysis [2]						Liquid limit	Plasticity index	Classification	
Percentage passing sieve—									
1–in	3/8–in	No. 4 (4.7 mm)	No. 10 (2.0 mm)	No. 40 (0.42 mm)	No. 200 (0.074 mm)			AASHTO [3]	Unified [4]
						Percent			
100		94	92	82	22		[5] NP	A–2–4(0)	SM
			100	97	61	54	29	A–7–6(16)	CH
100		99	99	99	54	55	29	A–7–6(12)	CH
	100	99	98	64	12		NP	A–2–4(0)	SP–SM
	100	99	98	72	23		NP	A–2–4(0)	SM
	100	99	98	65	34	49	23	A–2–7(2)	SC
		100	99	67	16		NP	A–2–4(0)	SM
		100	99	67	14		NP	A–2–4(0)	SM
100		99	99	71	25	22	5	A–2–4(0)	SM–SC

analyzed by the pipette method, and the material coarser than 2 millimeters in diameter is excluded from calculations of grain-sized fractions. The mechanical analyses used in this table are not suitable for use in naming textural classes for soil.

[3] Based on Standard Specifications for Highway Materials and Methods of Sampling and Testing (Pt. 1, Ed. 8): The Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes, AASHTO Designation M 145–49.

[4] Based on the Unified Soil Classification System (*2*).

[5] Nonplastic.

TABLE 6.—*Estimated soil properties*

[An asterisk in the first column indicates that at least one mapping unit in this series is made up of two or more kinds of soil. The instructions for referring to other series that appear in the first column of

Soil series and map symbols	Depth to seasonal high water table	Depth from surface	USDA texture	Classification	
				Unified	AASHTO
	In	*In*			
Alaga: AaB	>60	0–45	Loamy sand	SM	A–2
		45–80	Sand	SP–SM, SM	A–2, A–3
Alpin: ApA	>60	0–84	Sand	SP–SM	A–2, A–3
Ardilla: ArA	15	0–20	Sandy loam	SM	A–2
		20–38	Sandy clay loam	SM, SC, SM–SC	A–4
		38–70	Sandy clay loam	SM, SM–SC	A–4
* Bibb: Bb	10	0–60	Sandy loam, loam, silt loam.	SM, ML	A–2, A–4
For Osier part, see Osier series.		60–65	Sand	SP–SM	A–3
* Bigbee: BK	>42	0–15	Loamy sand, sand	SM, SP–SM	A–2
For Kalmia and Eunola parts, see Kalmia and Eunola series, respectively.		15–80	Sand	SP–SM	A–2, A–3
Bonifay: BoB	>60	0–42	Loamy sand	SM	A–2
		42–56	Sand	SP–SM, SM	A–2, A–3
		56–70	Sandy clay loam, sandy loam.	SM, SM–SC	A–4, A–2
Byars: By	0	0–15	Silt loam	ML, CL, CL–ML	A–4
		15–65	Clay	CH	A–7
* Chastain: CB	0	0–36	Silty clay	CL, CL–ML	A–4, A–6
For Bibb part, see Bibb series.		36–65	Loam	CL, ML, CL–ML	A–4
Dothan: DoA, DoB, DoC	30	0–6	Sandy loam	SM	A–2, A–4
		6–26	Sandy clay loam	SC, SM–SC, CL	A–4
		26–65	Sandy clay loam	SM–SC, SC	A–4
Esto: EsB, EsC	>60	0–6	Loamy sand	SM	A–2
		6–70	Clay, silty clay	CL, CH	A–6, A–7
Eunola: Eu	24	0–10	Sandy loam	SM	A–2
		10–56	Sandy clay loam, sandy loam.	SC, SM, SM–SC	A–2, A–4
		56–65	Loamy sand, sand	SM, SP–SM	A–2, A–3
Fuquay: FuB	>60	0–23	Loamy sand	SM, SP–SM	A–2
		23–33	Sandy loam	SM	A–2
		33–70	Sandy clay loam	SC, CL	A–2, A–4
Grady: Gr	0	0–12	Silt loam	ML, CL–ML	A–4
		12–65	Clay, silty clay	CL	A–6
Kalmia: KaA	>60	0–11	Loamy sand, sandy loam.	SM	A–2
		11–30	Sandy clay loam	SM, SC, SM–SC	A–4, A–2
		30–37	Sandy loam	SM	A–2
		37–80	Sand	SP–SM, SM	A–2, A–3
* Leaf: Le	6	0–13	Loam, silt loam	ML, CL	A–4, A–6
For Lenoir part, see Lenoir series.		13–88	Clay, silty clay	CH, CL	A–7
Lenoir	12	0–7	Sandy loam	SM, SM–SC	A–2, A–4
Mapped only in complex with Leaf soils.		7–13	Sandy clay loam	SM–SC, SC, SM	A–4
		13–94	Clay	ML, CL	A–7
Lucy: LuB	>60	0–30	Loamy sand	SM, SP–SM	A–2
		30–80	Sandy clay loam	SC, SM–SC	A–2, A–4
Orangeburg: OrA, OrB, OrC	>60	0–7	Sandy loam	SM	A–2, A–4
		7–75	Sandy clay loam	SC	A–6

significant in engineering

soils in such mapping units may have different properties and limitations, and for this reason it is necessary to follow carefully the this table. The symbol > means more than. The symbol < means less than]

Percentage less than 3 inches passing sieve—				Liquid limit	Plasticity index	Permeability	Available water capacity	Reaction	Shrink-swell potential
No. 4 (4.7 mm)	No. 10 (2.0 mm)	No. 40 (0.42 mm)	No. 200 (0.074 mm)						
				Pct		*In per hr*	*In per in of soil*	*pH*	
100	95–100	50–75	15–30		[1] NP	>6.0	0.05–0.07	4.5–5.5	Low.
100	95–100	50–70	5–15		NP	>6.0	<0.05	5.1–5.5	Low.
100	100	50–70	5–12		NP	>20.0	<0.05	5.1–5.5	Very low.
100	95–100	50–85	20–35		NP	2.0–6.0	0.08–0.10	5.1–5.5	Low.
100	95–100	80–90	35–49	<35	NP–8	0.6–2.0	0.09–0.11	5.1–5.5	Low.
100	95–100	70–90	40–49	<25	NP–7	0.2–0.6	0.10–0.12	5.1–5.5	Low.
95–100	90–100	60–90	30–60	<30	NP–7	0.6–2.0	0.12–0.15	4.5–5.5	Low.
100	95–100	50–70	5–10		NP	>6.0	<0.05	5.1–5.5	Low.
100	100	50–75	10–25		NP	6.0–20.0	0.05–0.07	4.5–5.5	Low.
100	100	50–70	5–12		NP	6.0–20.0	<0.05	4.5–5.5	Low.
100	95–100	50–75	15–30		NP	>6.0	0.05–0.08	4.5–5.5	Low.
100	95–100	50–70	5–15		NP	>6.0	<0.05	4.5–5.5	Low.
100	90–100	65–85	30–50	<28	NP–7	0.6–2.0	0.10–0.13	4.5–5.5	Low.
100	100	85–100	70–90	<20	NP–8	0.6–2.0	0.15–0.18	4.5–5.5	Low.
100	100	90–100	75–95	50–75	30–45	0.06–0.2	0.12–0.15	4.5–5.5	Moderate.
100	100	90–100	80–95	25–40	5–15	0.06–0.2	0.14–0.17	4.5–5.5	Moderate.
100	100	80–95	60–80	25–40	5–10	0.2–0.6	0.15–0.18	4.5–5.5	Low.
100	95–100	60–85	20–40		NP	2.0–6.0	0.10–0.14	4.5–5.5	Low.
100	95–100	80–90	36–55	20–30	5–8	0.6–2.0	0.12–0.16	4.5–5.5	Low.
100	95–100	85–90	36–50	20–30	4–8	0.2–0.6	0.12–0.16	4.5–5.5	Low.
90–100	90–100	50–85	15–30		NP	>6.0	0.05–0.10	4.5–5.5	Low.
98–100	95–100	80–100	50–70	35–60	15–35	0.06–0.2	0.10–0.15	4.5–5.5	Moderate.
100	95–100	60–75	30–35		NP	2.0–6.0	0.08–0.10	4.5–5.5	Low.
100	95–100	65–85	30–49	15–30	2–10	0.6–2.0	0.12–0.14	4.5–5.5	Low.
100	95–100	50–70	5–20		NP	>6.0	<0.06	4.5–5.5	Low.
98–100	98–100	50–75	10–30		NP	>6.0	0.07–0.09	4.5–5.5	Low.
98–100	98–100	60–75	20–35	<10	NP–4	2.0–6.0	0.13–0.15	4.5–5.5	Low.
98–100	98–100	60–90	30–55	20–50	8–25	0.06–0.20	0.14–0.16	4.5–5.5	Low.
100	100	85–95	70–80	<20	NP–6	0.6–2.0	0.10–0.13	4.5–5.5	Low.
100	100	90–100	55–90	27–39	13–22	<0.2	0.10–0.12	4.5–5.5	Moderate.
100	95–100	65–90	15–30		NP	2.0–6.0	0.05–0.10	5.1–5.5	Low.
100	90–100	70–90	30–50	25–35	4–10	0.6–2.0	0.16–0.20	4.5–5.0	Low.
100	95–100	60–70	20–30		NP	2.0–6.0	0.10–0.13	4.5–5.0	Low.
100	90–100	50–70	5–15		NP	>6.0	<0.05	4.5–5.0	Low.
100	100	80–95	55–80	30–40	8–13	0.06–0.20	0.16–0.20	4.5–5.5	Low.
100	100	90–100	75–95	40–55	20–35	<0.02	0.12–0.16	4.5–5.5	Moderate.
100	100	60–80	30–50	<20	NP–7	2.0–6.0	0.12–0.14	4.5–5.5	Low.
100	100	80–90	36–50	15–25	2–10	0.6–2.0	0.15–0.17	4.5–5.5	Low.
100	100	90–100	70–90	40–50	15–25	<0.20	0.13–0.15	4.5–5.5	Moderate.
95–100	95–100	50–90	10–30		NP	>6.0	0.08–0.12	5.1–5.5	Low.
95–100	95–100	55–85	20–50	20–30	5–10	0.6–2.0	0.12–0.14	5.1–5.5	Low.
98–100	95–100	60–70	30–40		NP	2.0–6.0	0.07–0.10	5.1–5.5	Low.
98–100	95–100	80–90	36–50	25–40	10–20	0.6–2.0	0.10–0.13	4.5–5.5	Low.

TABLE 6.—*Estimated soil properties*

Soil series and map symbols	Depth to seasonal high water table	Depth from surface	USDA texture	Classification	
				Unified	AASHTO
	In	*In*			
Osier	12	0–7	Loam	CL, ML, CL–ML	A–4
Mapped only in an undifferentiated unit with Bibb soils.		7–28	Loamy sand	SM	A–2
		28–65	Sand	SP–SM, SM	A–2, A–3
Plummer: Pm	12	0–45	Sand, loamy sand	SM, SP–SM	A–2
		45–62	Sandy loam	SM	A–2, A–4
Rains: Ra	6	0–13	Sandy loam	SM, SM–SC, SC	A–2, A–4
		13–31	Sandy clay loam	SC, CL	A–4, A–6
		31–65	Sandy clay loam	ML, CL	A–7, A–4, A–6
Red Bay: RbA, RbB, RbC, RsD	>60	0–6	Sandy loam, loamy sand.	SM	A–2, A–4
		6–90	Sandy clay loam	SC, SM–SC	A–4
Troup: TrB, TrC	>60	0–56	Loamy sand, sand	SM, SP–SM	A–2
		56–95	Sandy loam	SC, SM–SC	A–2, A–4

[1] Nonplastic.

TABLE 7.—*Interpretations of engineering*

[An asterisk in the first column indicates that at least one mapping unit in this series is made up of two or more kinds of soil. The instructions for referring to other series

Soil series and map symbols	Suitability as source of—			
	Road fill	Sand	Topsoil	Pond reservoir areas
Alaga: AaB	Good	Fair: content of fines	Poor: sandy texture	Rapid permeability
Alpin: ApA	Good	Fair: content of fines	Poor: sandy texture	Very rapid permeability
Ardilla: ArA	Fair: soil drainage class; content of fines.	Unsuited: no sand	Good	Moderate permeability
* Bibb: Bb For Osier part, see Osier series.	Poor: soil drainage class.	Poor: content of fines	Poor: soil drainage class.	Seasonal high water table.
* Bigbee: BK For Kalmia and Eunola parts, see Kalmia and Eunola series, respectively.	Good	Good	Poor: sandy texture	Rapid permeability
Bonifay: BoB	Good	Poor: content of fines	Poor: sandy texture	Rapid permeability to a depth of 56 inches; moderate permeability below a depth of 56 inches.

significant in engineering—Continued

Percentage less than 3 inches passing sieve—				Liquid limit	Plasticity index	Permeability	Available water capacity	Reaction	Shrink-swell potential
No. 4 (4.7 mm)	No. 10 (2.0 mm)	No. 40 (0.42 mm)	No. 200 (0.074 mm)						
				Pct		*In per hr*	*In per in of soil*	*pH*	
100	100	85–95	60–75	<25	NP–10	0.6–2.0	0.10–0.13	4.5–5.5	Low.
100	100	50–75	15–30		NP	>6.0	0.05–0.10	4.5–5.5	Low.
100	100	50–70	5–15		NP	>6.0	0.02–0.05	4.5–5.5	Low.
100	100	50–75	10–30		NP	2.0–6.0	0.05–0.08	4.5–5.5	Low.
100	100	60–70	30–40	<20	NP–4	0.6–2.0	0.10–0.13	4.5–5.5	Low.
100	100	60–85	30–50	<25	NP–10	2.0–6.0	0.08–0.12	4.5–5.5	Low.
100	100	70–90	36–55	25–40	7–18	0.6–2.0	0.10–0.14	4.5–5.5	Low.
100	100	80–95	40–70	35–45	8 20	0.6–2.0	0.12–0.15	4.5–5.5	Low.
100	90–100	60–70	20–40		NP	2.0–6.0	0.07–0.10	5.1–6.0	Low.
100	95–100	80–90	36–49	20–30	5–10	0.6–2.0	0.10–0.12	5.1–5.5	Low.
100	95–100	50–75	10–30		NP	>6.0	0.05–0.10	4.5–5.0	Very low.
95–100	95–100	60–75	25–40	15–30	5–10	0.6–2.0	0.10–0.13	4.5–5.5	Low.

properties of the soils

soils in such mapping units may have different properties and limitations, and for this reason it is necessary to follow carefully the that appear in the first column of this table]

Soil features affecting—				
Pond embankments	Drainage for crops and pasture	Irrigation	Terraces and diversions	Grassed waterways
Rapid permeability; high susceptibility to piping.	Not needed	Rapid infiltration; low available water capacity.	Not needed	Not needed.
Permeability of compacted soil; medium to high susceptibility to piping.	Not needed	Very rapid infiltration; very low available water capacity.	Not needed	Not needed.
Medium to high susceptibility to piping.	Moderate permeability; suitable for open-ditch drainage; seasonal high water table.	Moderately rapid infiltration; low or moderate available water capacity; plinthic horizon at a depth of 20 inches.	Not needed	Not needed.
Medium to high susceptibility to piping; medium shear strength.	Seasonal high water table; flooding.	Seasonal high water table; flooding.	Not needed	Not needed.
Rapid permeability; medium to high susceptibility to piping.	Not needed	Rapid infiltration; very low available water capacity.	Not needed	Not needed.
Medium to high susceptibility to piping; medium shear strength.	Not needed	Rapid infiltration; low available water capacity.	Not needed	Not needed.

TABLE 7.—*Interpretations of engineering*

Soil series and map symbols	Suitability as source of—			
	Road fill	Sand	Topsoil	Pond reservoir areas
Byars: By	Poor: wetness; traffic-supporting capacity.	Unsuited: no sand	Poor: soil drainage class.	Slow permeability; high water table.
* **Chastain:** CB For Bibb part, see Bibb series.	Poor: soil drainage class.	Unsuited: no sand	Poor: soil drainage class.	Seasonal high water table.
Dothan: DoA, DoB, DoC	Good	Unsuited: no sand	Fair: thickness of material.	Moderate and slow permeability.
Esto: EsB, EsC	Poor: unified soil group.	Unsuited: no sand	Poor: thickness of material.	Slow permeability
Eunola: Eu	Fair: content of fines	Poor: content of fines	Fair: thickness of material.	Moderate and rapid permeability; seasonal high water table.
Fuquay: FuB	Fair: unified soil group.	Poor: content of fines	Poor: sandy texture	Rapid and moderately rapid permeability to a depth of 33 inches; slow permeability below a depth of 33 inches.
Grady: Gr	Poor: soil drainage class.	Unsuited: no sand	Poor: soil drainage class.	Slow permeability; seasonal high water table.
Kalmia: KaA	Fair: content of fines	Fair: content of fines	Poor: sandy texture	Moderate to rapid permeability.
* **Leaf:** Le For Lenoir part, see Lenoir series.	Poor: soil drainage class.	Unsuited: no sand	Poor: soil drainage class.	Slow to very slow permeability; seasonal high water table.
Lenoir Mapped only in complex with Leaf soils.	Poor: unified soil group.	Unsuited: no sand	Fair: thickness of material.	Slow permeability; seasonal high water table.
Lucy: LuB	Fair: content of fines	Poor to unsuited: content of fines.	Poor: sandy texture	Moderate to rapid permeability.
Orangeburg: OrA, OrB, OrC.	Fair: content of fines	Unsuited: no sand	Fair: thickness of material.	Moderate permeability
Osier Mapped only in an undifferentiated unit with Bibb soils.	Poor: flooding; high water table.	Fair: content of fines	Poor: soil drainage class.	Rapid permeability; seasonal high water table.
Plummer: Pm	Poor: soil drainage class.	Poor to unsuited: content of fines.	Poor: soil drainage class.	Moderate and moderately rapid permeability; seasonal high water table.

properties of the soils—Continued

Soil features affecting—				
Pond embankments	Drainage for crops and pasture	Irrigation	Terraces and diversions	Grassed waterways
High compressibility; medium to low shear strength.	Ponding; seasonal high water table; slow permeability; availability of outlets.	Not needed	Not needed	Not needed.
Medium to low shear strength.	Flooding; seasonal high water table; availability of outlets.	Not needed	Not needed	Not needed.
Medium to low shear strength and susceptibility to piping.	Not needed	Moderately rapid infiltration; moderate available water capacity.	Easy to build and maintain.	Easy to establish vegetation.
Moderate to low shear strength; medium compressibility.	Not needed	Slow permeability; moderate available water capacity; moderate to severe erosion hazard.	Clayey subsoil	Vegetation difficult to establish.
Medium to high susceptibility to piping; medium shear strength.	Not needed	Moderately rapid infiltration; moderate available water capacity.	Not needed	Not needed.
Medium to low shear strength and susceptibility to piping.	Not needed	Rapid and moderately rapid infiltration; moderate available water capacity.	Not needed	Not needed.
Medium to low shear strength and susceptibility to piping.	Flooding; slow permeability; outlets difficult to locate.	Not needed	Not needed	Not needed.
Medium to low shear strength.	Not needed	Moderately rapid infiltration; moderate to low available water capacity.	Not needed	Not needed.
Medium to high compressibility; medium to low shear strength.	Slow to very slow permeability; seasonal high water table.	Moderate to high available water capacity; moderate infiltration.	Not needed	Not needed.
Medium to low shear strength; medium to high susceptibility to piping.	Clayey texture; slow permeability; outlets difficult to establish; seasonal high water table.	Moderate available water capacity; moderately rapid infiltration.	Not needed	Not needed.
Medium to high susceptibility to piping; medium to low shear strength.	Not needed	Rapid infiltration; low to moderate available water capacity.	Easy to construct; moderate hazard of erosion.	Vegetation easy to establish; severe hazard of erosion.
Medium to low shear strength; low to medium compressibility.	Not needed	Moderately rapid infiltration; moderate available water capacity.	Easy to construct; moderate hazard of erosion.	Vegetation easy to establish.
Medium to high susceptibility to piping; low to medium compressibility.	Rapid permeability; sandy texture; flooding; seasonal high water table.	Low available water capacity; flooding; seasonal high water table; poorly or very poorly drained.	Not needed	Not needed.
Medium to high susceptibility to piping; medium to low shear strength.	Seasonal high water table; moderate to moderately rapid permeability; outlets difficult to establish.	Seasonal high water table; moderately rapid infiltration; poorly drained.	Not needed	Not needed.

TABLE 7.—*Interpretations of engineering*

Soil series and map symbols	Suitability as source of—			
	Road fill	Sand	Topsoil	Pond reservoir areas
Rains: Ra	Poor: soil drainage class.	Unsuited: no sand	Poor: soil drainage class.	Moderate permeability; seasonal high water table.
Red Bay: RbA, RbB, RbC, RsD.	Fair: content of fines	Unsuited: no sand	Fair: sandy texture	Moderate permeability
Troup: TrB, TrC	Fair: content of fines	Poor: content of fines	Poor: sandy texture	Moderately rapid to moderate permeability.

TABLE 8.—*Degree and kind of limitation*

Soil series and map symbols	Septic tank absorption fields	Sewage lagoons	Dwellings without basements	Sanitary landfill [1]
Alaga: AaB	Slight	Severe: rapid permeability.[2]	Slight	Severe: rapid permeability.[2]
Alpin: ApA	Slight	Severe: very rapid permeability.[2]	Slight	Severe: very rapid permeability.[2]
Ardilla: ArA	Severe: seasonal high water table; moderately slow permeability.	Moderate: seepage	Moderate: seasonal high water table.	Severe: seasonal high water table.
Bibb: Bb For Osier part, see Osier series.	Severe: flooding; seasonal high water table.	Severe: flooding; seasonal high water table.	Severe: seasonal high water table; drainage; flooding.	Severe: flooding; seasonal high water table; drainage.
Bigbee: BK For Kalmia and Eunola parts, see Kalmia and Eunola series, respectively.	Severe: flooding	Severe: rapid permeability; flooding.	Severe: flooding	Severe: rapid permeability; flooding.
Bonifay: BoB	Slight	Severe: rapid permeability.[2]	Slight	Moderate: texture
Byars: By	Severe: flooding; slow permeability; seasonal high water table.	Moderate: excess humus.	Severe: flooding; drainage; seasonal high water table.	Severe: flooding; drainage; seasonal high water table.
Chastain: CB For Bibb part, see Bibb series.	Severe: flooding; seasonal high water table; slow permeability.	Severe: flooding; seasonal high water table.	Severe: flooding; drainage; seasonal high water table.	Severe: flooding; drainage; seasonal high water table.
Dothan:				
DoA	Moderate: moderately slow permeability.	Slight	Slight	Severe: seasonal high water table.
DoB	Moderate: moderately slow permeability.	Moderate: slope	Slight	Severe: seasonal high water table.
DoC	Moderate: moderately slow permeability.	Moderate: slope	Slight	Severe: seasonal high water table.
Esto:				
EsB	Severe: slow permeability.	Moderate: slope	Moderate: unified soil group.	Moderate: clayey texture.

properties of the soils—Continued

Soil features affecting—				
Pond embankments	Drainage for crops and pasture	Irrigation	Terraces and diversions	Grassed waterways
Medium to low shear strength; low to medium compressibility.	Seasonal high water table; moderate permeability; outlets difficult to establish.	Moderately rapid infiltration; seasonal high water table; poorly drained.	Not needed	Not needed.
Medium to low shear strength; medium compressibility.	Not needed	Moderately rapid infiltration; moderate available water capacity.	Easy to build and maintain; severe hazard of gullies.	Vegetation easy to establish; severe hazard of gullies.
Medium to high susceptibility to piping; medium to low shear strength.	Not needed	Moderately rapid infiltration; low available water capacity.	Easy to construct; moderate hazard of shallow gullies.	Vegetation not easy to establish; severe hazard of gullies.

for use in town and country planning—Continued

Local roads and streets	Camp areas	Picnic areas	Playgrounds	Paths and trails
Slight	Moderate: loamy sand surface layer.	Moderate: loamy sand surface layer.	Moderate: loamy sand surface layer; slope of more than 2 percent.	Moderate: loamy sand surface layer.
Slight	Severe: sand surface layer.	Severe: sand surface layer.	Severe: sand surface layer.	Severe: sand surface layer.
Moderate: drainage	Moderate: wetness	Moderate: wetness	Severe: wetness	Moderate: wetness.
Severe: flooding; drainage.	Severe: flooding; wetness.	Severe: flooding; wetness.	Severe: flooding; wetness.	Severe: flooding; wetness.
Severe: flooding	Severe: loamy sand and sand surface layer; flooding.	Moderate: loamy sand and sand surface layer; flooding.	Severe: loamy sand and sand surface layer; flooding.	Moderate: loamy sand and sand surface layer; flooding.
Slight	Moderate: loamy sand surface layer.	Moderate: loamy sand surface layer.	Moderate: loamy sand surface layer.	Moderate: loamy sand surface layer.
Severe: flooding; drainage; unified soil group.	Severe: flooding; wetness.	Severe: flooding; wetness.	Severe: flooding; wetness.	Severe: flooding; wetness.
Severe: flooding; drainage.	Severe: flooding; wetness.	Severe: flooding; wetness.	Severe: flooding; wetness.	Severe: flooding; wetness.
Slight	Slight	Slight	Slight	Slight.
Slight	Slight	Slight	Moderate: slope	Slight.
Slight	Slight	Slight	Severe: slope	Slight.
Severe: unified soil group.	Moderate: slow permeability.	Slight	Moderate: slope	Slight.

TABLE 8.—*Degree and kind of limitation*

Soil series and map symbols	Septic tank absorption fields	Sewage lagoons	Dwellings without basements	Sanitary landfill [1]
EsC	Severe: slow permeability.	Moderate if slopes are 5 to 7 percent. Severe if slopes are more than 7 percent.	Moderate: unified soil group.	Moderate: clayey texture.
Eunola: Eu	Severe: seasonal high water table.	Severe: seasonal high water table; rapid permeability in underlying material.[2]	Moderate: seasonal high water table.	Severe: rapid permeability; seasonal high water table.[2]
Fuquay: FuB	Moderate: slow permeability.	Slight	Slight	Slight
Grady: Gr	Severe: flooding; seasonal high water table: slow permeability.	Severe: flooding; seasonal high water table.	Severe: flooding; drainage; seasonal high water table.	Severe: flooding; drainage; seasonal high water table.
Kalmia: KaA	Slight	Severe: rapid permeability.[2]	Slight	Severe: rapid permeability.[2]
Leaf: Le For Lenoir part, see Lenoir series.	Severe: seasonal high water table; slow to very slow permeability.	Slight	Severe: seasonal high water table; drainage; unified soil group.	Severe: seasonal high water table; drainage; clayey texture.
Lenoir Mapped only in complex with Leaf soils.	Severe: slow permeability; seasonal high water table.	Slight	Severe: seasonal high water table.	Severe: seasonal high water table; clayey texture.
Lucy: LuB	Slight	Severe: rapid permeability.	Slight	Slight
Orangeburg:				
OrA	Slight	Moderate: moderate permeability.	Slight	Slight
OrB	Slight	Moderate: moderate permeability; slope.	Slight	Slight
OrC	Slight	Moderate: moderate permeability; slope.	Slight	Slight
Osier Mapped only in complex with Bibb soils.	Severe: flooding; seasonal high water table.	Severe: seasonal high water table; rapid permeability.[2]	Severe: flooding; seasonal high water table.	Severe: flooding; seasonal high water table; rapid permeability.[2]
Plummer: Pm	Severe: seasonal high water table.	Severe: seasonal high water table; moderately rapid permeability.[2]	Severe: seasonal high water table; drainage.	Severe: seasonal high water table; drainage.
Rains: Ra	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table; drainage.	Severe: seasonal high water table; drainage.
Red Bay:				
RbA	Slight	Moderate: moderate permeability.	Slight	Slight
RbB	Slight	Moderate: moderate permeability; slope.	Slight	Slight
RbC	Slight	Moderate: moderate permeability; slope.	Slight	Slight
RsD	Moderate: slope	Severe: slope	Moderate: slope	Slight

for use in town and country planning—Continued

Local roads and streets	Camp areas	Picnic areas	Playgrounds	Paths and trails
Severe: unified soil group.	Moderate: slow permeability; slopes more than 8 percent.	Slight if slopes are 5 to 8 percent. Moderate if slopes are more than 8 percent.	Severe: slope	Slight.
Slight	Moderate: seasonal high water table.	Slight	Moderate: seasonal high water table.	Slight.
Moderate: unified soil group.	Moderate: loamy sand surface layer.	Moderate: loamy sand surface layer.	Moderate: loamy sand surface layer; slope.	Moderate: loamy sand surface layer.
Severe: flooding; drainage; unified soil group.	Severe: flooding; wetness.	Severe: flooding; wetness.	Severe: flooding; wetness.	Severe: flooding; wetness.
Slight	Slight	Slight	Slight	Slight.
Severe: drainage; unified soil group.	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness.
Severe: unified soil group.	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness.
Slight	Moderate: loamy sand surface layer.	Moderate: loamy sand surface layer.	Moderate: loamy sand surface layer.	Moderate: loamy sand surface layer.
Slight	Slight	Slight	Slight	Slight.
Slight	Slight	Slight	Moderate: slope	Slight.
Slight	Slight	Slight	Severe: slope	Slight.
Severe: flooding; seasonal high water table.	Severe: flooding; wetness.	Severe: flooding; wetness.	Severe: flooding; wetness.	Severe: flooding; wetness.
Severe: drainage	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness.
Severe: drainage	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness.
Slight	Slight	Slight	Slight	Slight.
Slight	Slight	Slight	Moderate: slope	Slight.
Slight	Slight	Slight	Severe: slope	Slight.
Moderate: slope	Moderate: slope	Moderate: slope	Severe: slope	Slight.

TABLE 8.—*Degree and kind of limitation*

Soil series and map symbols	Septic tank absorption fields	Sewage lagoons	Dwellings without basements	Sanitary landfill [1]
Troup:				
TrB	Slight	Severe: moderately rapid to moderate permeability.[2]	Slight	Severe: moderately rapid permeability.
TrC	Slight to moderate: slope.	Severe: moderately rapid to moderate permeability.[2]	Slight to moderate: slope.	Severe: moderately rapid permeability.

[1] Onsite studies of the underlying strata, water tables, and hazards of aquifer pollution and drainage into ground water need to be made for landfills deeper than 5 or 6 feet.

by tests to determine the liquid limits and plastic limits. Mechanical analyses were made by combined sieve and hydrometer methods. The percentages of clay obtained by the hydrometer methods should not be used in naming textural classes of soils.

Engineering properties

Several estimated soil properties significant in engineering are given in table 6. These estimates are made for typical soil profiles, by layers sufficiently different to have different significance for soil engineering. The estimates are based on field observations made in the course of mapping, on test data for these and similar soils, and on experience with the same kinds of soil in other counties. Following are explanations of some of the columns in table 6.

The depth to bedrock column is not listed on this table because the depth to bedrock is greater than 5 feet for all soils in this county.

Depth to seasonal high water table is distance from the surface of the soil to the highest level that ground water reaches in the soil in most years.

The depth from the surface is for a representative profile and may vary slightly in other profiles of the same series.

Soil scientists use the USDA textural classification (*5*). In this, the texture of the soil is determined according to the proportion of soil particles smaller than 2 millimeters in diameter, that is, the proportion of sand, silt, and clay. These and other terms used in USDA textural clasification are defined in the Glossary of this soil survey. Also listed are the Unified and the AASHTO classifications.

Liquid limit and plasticity index indicate the effect of water on the strength and consistence of soil material. As the moisture content of a clayey soil is increased from a dry state, the material changes from a semisolid to a plastic. If the moisture content is further increased, the material changes from a plastic to a liquid. The plastic limit is the moisture content at which the soil material changes from semisolid to plastic; and the liquid limit, from plastic to liquid. The plasticity index is the numerical difference between the liquid limit and the plastic limit. It indicates the range of moisture content within which a soil material is plastic. Liquid limit and plasticity index are estimated in table 6, but in table 5 data on liquid limit and plasticity index are based on tests of soil samples.

Permeability is that quality of a soil that enables it to transmit water or air. It is estimated on basis of these soil characteristics observed in the field, particularly structure and texture. The estimates in table 6 do not take into account lateral seepage or such transient soil features as plowpans and surface crusts.

Available water capacity is the capacity of soils to hold water for use by most plants. It is commonly defined as the difference between the amount of water in the soil at field capacity and the amount at the wilting point of most crop plants.

Reaction is the degree of acidity or alkalinity of a soil, expressed in pH values. The pH value and terms used to describe soil reaction are explained in the Glossary.

Shrink-swell potential is the relative change in volume to be expected of soil material with changes in moisture content, that is, the extent to which the soil shrinks as it dries out or swells when it gets wet. Extent of shrinking and swelling is influenced by the amount and kind of clay in the soil. Shrinking and swelling of soils cause much damage to building foundations, roads, and other structures. A *high* shrink-swell potential indicates a hazard to maintenance of structures built in, on, or with material having this rating.

Engineering interpretations

The estimated interpretations in table 7 are based on the engineering properties of soils shown in table 6, on test data for soils in this survey area and in others nearby or adjoining, and on the experience of engineers and soil scientists with soils of Geneva County. In table 7, ratings are used to summarize suitability of the soils for all listed purposes other than for pond reservoir areas, pond embankments, drainage for crops and pasture, irrigation, terraces and diversions, and grassed waterways. For these particular uses, table 7 lists those soil features not to be overlooked in planning, installation, and maintenance.

Soil suitability is rated by the terms *good, fair,* and *poor.*

In the paragraphs that follow, each column is defined and the properties important in determining the suitability of the soils for each use are given. This information can be used along with the information in table 6, with information in other parts of the survey, and with the soil map at the back of the survey as a

for use in town and country planning—Continued

Local roads and streets	Camp areas	Picnic areas	Playgrounds	Paths and trails
Slight	Moderate: loamy sand surface layer.	Moderate: loamy sand surface layer.	Moderate: loamy sand surface layer; slope.	Moderate: loamy sand surface layer.
Slight to moderate: slope.	Moderate: loamy sand surface layer; slope.	Moderate: loamy sand surface layer; slope.	Severe: slope	Moderate: loamy sand surface layer.

[2] Hazard of pollution of underground water supplies due to rapid or very rapid permeability of the soil.

guide in planning the use of the soils for various engineering properties. Site investigation is needed before construction.

Road fill is soil material used in embankments for roads. The suitability ratings reflect the predicted performance of soil after it has been placed in an embankment that has been properly compacted and provided with adequate drainage and the relative ease of excavating the material at borrow areas.

Sand is used in great quantities in many kinds of construction. The ratings in table 7 provide guidance about where to look for probable sources. A soil rated as a *good* or *fair* source of sand generally has a layer at least 3 feet thick, the top of which is within a depth of 6 feet. The ratings do not take into account thickness of overburden, location of the water table, or other factors that affect mining of the materials; and neither do they indicate quality of the deposit.

Topsoil is used for topdressing an area where vegetation is to be established and maintained. Suitability is affected mainly by ease of working and spreading the soil material, as for preparing a seedbed; natural fertility of the material, or the response of plants when fertilizer is applied; and absence of substances toxic to plants. Texture of the soil material and its content of stone fragments are characteristics that affect suitability, but also considered in the ratings is damage that results at the area from which topsoil is taken.

Pond reservoir areas hold water behind a dam or embankment. Soils suitable for pond reservoir areas have low seepage, which is related to their permeability and depth to fractured or permeable bedrock or other permeable material.

Pond embankments require soil material resistant to seepage and piping and of favorable stability, shrink-swell potential, shear strength, and compactibility. Presence of stones or organic material in a soil is among factors that are unfavorable.

Drainage for crops and pasture is affected by such soil properties as permeability, texture, and structure; depth to claypan, rock, or other layers that influence rate of water movement; depth to the water table; slope; stability in ditchbanks; susceptibility to stream overflow; salinity or alkalinity; and availability of outlets for drainage.

Irrigation of a soil is affected by such features as slope; susceptibility to stream overflow, water erosion, or soil blowing; soil texture; content of stones; accumulations of salts and alkali; depth to root zone; rate of water intake at the surface; permeability of soil layers below the surface layer and in fragipans or other layers that restrict movement of water; amount of water held available to plants; need for drainage; and depth to water table or bedrock.

Terraces and diversions are embankments, or ridges, constructed across the slope to intercept runoff so that it soaks into the soil or flows slowly to a prepared outlet. Features that affect suitability of a soil for terraces are uniformity and steepness of slope; depth to bedrock or other favorable material; presence of stones; permeability; and resistance to water erosion, soil slipping, and soil blowing. A soil suitable for these structures provides outlets for runoff and is not difficult to vegetate.

Grassed waterways are natural or constructed waterways or outlets shaped and established in suitable vegetation to safely dispose of runoff from a field, diversion, terrace, or other structure. Features that affect suitability of a soil for grassed waterways are slope, texture, erosion hazard, permeability, and available water capacity. Also, vegetation must be easily established.

Town and country planning

This section was prepared chiefly for planners, builders, landscape architects, zoning officials, private and potential landowners, and others interested in using the soils for purposes other than farming. Table 8 shows the degree and kind of limitation of each soil in the county for specified nonfarm purposes.

The suitability of the soils must be determined in selecting a site for a residence, a highway, a recreational use, or any other nonfarm purpose. Among the important properties considered are texture, reaction, depth, shrink-swell potential, slope, permeability, depth to hard rock and to the water table, and the flood hazard.

The degrees of limitation shown in table 8 are noted as slight, moderate, and severe. Slight means that few or no adjustments are needed. Moderate means that some adjustment is needed to make the soil suitable for a specified use. Severe means that extensive adjustments are needed.

Flooding, as mentioned in table 8, refers to the hazard of stream overflow or to flooding caused by runoff or seepage. The degree of the limitation caused by flooding, as shown in table 8, expresses the frequency of flooding and the length of time that water remains on the surface.

In the paragraphs that follow, each nonfarm use is defined and the properties important in determining the limitations of the soils for each use are given. This information can be used along with the information in table 6, with information in other parts of the survey, and with the soil map at the back of the survey as a guide in planning the use of the soils for nonfarm purposes. Site investigation is needed before construction.

Septic tank absorption fields are subsurface systems of tile or perforated pipe that distribute effluent from a septic tank into natural soil. The soil material between depths of 18 inches and 6 feet is evaluated. The soil properties considered are those that affect both absorption of effluent and construction and operation of the system. Properties that affect absorption are permeability, depth to water table or rock, and susceptibility to flooding. Slope affects difficulty of layout and construction and also the risk of soil erosion, lateral seepage, and downslope flow of effluent. Large rocks or boulders increase construction costs.

Sewage lagoons are shallow ponds constructed to hold sewage within a depth of 2 to 5 feet long enough for bacteria to decompose the solids. A lagoon has a nearly level floor, and sides, or embankments, of compacted soil material. It is assumed that the embankment is compacted to medium density and the pond is protected from flooding. Properties that affect the pond floor and the embankment are considered. Those that affect the pond floor are permeability, organic matter, and slope, and if the floor needs to be leveled, depth to bedrock is important. The soil properties that affect the embankment are the engineering properties of the embankment material as interpreted from the Unified Soil Classification and the amounts of stones, if any, that influence the ease of excavation and compaction of the embankment material.

Dwellings without basements, as rated in table 8, are not more than three stories high and are supported by foundation footings placed in undisturbed soil. The features that affect the rating of a soil for dwellings are those that relate to capacity to support load and resist settlement under load and those that relate to ease of excavation. Soil properties that affect capacity to support load are wetness, susceptibility to flooding, density, plasticity, texture, and shrink-swell potential. Those that affect excavation are wetness, slope, depth to bedrock, and content of stones and rocks.

Sanitary landfill is a method of disposing of refuse in dug trenches. The waste is spread in thin layers, compacted, and covered with soil throughout the disposal period. Landfill areas are subject to heavy vehicular traffic. Some soil properties that affect suitability for landfill are ease of excavation, hazard of polluting ground water, and trafficability. The best soils have moderately slow permeability, withstand heavy traffic, and are friable and easy to excavate. Unless otherwise stated the ratings in table 8 apply only to a depth of about 6 feet, and therefore limitation ratings of *slight* or *moderate* may not be valid if trenches are to be much deeper than that. Reliable predictions can be made to a depth of 10 to 15 feet for some soils, but every site should be investigated before it is selected.

Local roads and streets, as rated in table 8, have an all-weather surface expected to carry automobile traffic all year. They have a subgrade of underlying soil material; a base consisting of gravel, crushed rock, or soil material stabilized with lime or cement; and a flexible or rigid surface, commonly asphalt or concrete. These roads are graded to shed water and have ordinary provisions for drainage. They are built mainly from soil at hand, and most cuts and fills are less than 6 feet deep.

Soil properties that most affect design and construction of roads and streets are load-supporting capacity and stability of the subgrade and the workability and quantity of cut and fill material available. The AASHTO and Unified classifications of the soil material and the shrink-swell potential indicate traffic-supporting capacity. Wetness and flooding affect stability of the material. Slope, depth to hard rock, content of stones and rocks, and wetness affect ease of excavation and amount of cut and fill needed to reach an even grade.

Camp areas are used intensively for tents and small camp trailers and the accompanying activities of outdoor living. Little preparation of the site is required, other than shaping and leveling for tent and parking areas. Camp areas are subject to heavy foot traffic and limited vehicular traffic. The best soils have mild slopes, good drainage, a surface free of rocks and coarse fragments, freedom from flooding during periods of heavy use, and a surface that is firm after rain but not dusty when dry.

Picnic areas are attractive natural or landscaped tracts used primarily for preparing meals and eating outdoors. These areas are subject to heavy foot traffic. Most of the vehicular traffic, however, is confined to access roads. The best soils are firm when wet but not dusty when dry; are free of flooding during the season of use; do not have slopes or stoniness that greatly increases cost of leveling sites or of building access roads.

Playgrounds are areas used intensively for baseball, football, badminton, and similar organized games. Soils suitable for this use need to withstand intensive foot traffic. The best soils for this use have a nearly level surface free of coarse fragments and rock outcrops, good drainage, freedom from flooding during periods of heavy use, and a surface that is firm after rain but not dusty when dry.

Paths and trails are used for local and cross country travel by foot or horseback. Design and layout should require little or no cutting and filling. The best soils are at least moderately well drained, are firm when wet but not dusty when dry, are flooded not more than once during the season of use, have slopes of less than 15 percent, and have few or no rocks or stones on the surface.

Formation, Morphology, and Classification of the Soils

This section describes the major factors that have affected the formation and composition of the soils of Geneva County. It describes briefly the principal processes of soil formation and shows how the soils of the county are classified into categories broader than the series.

Factors of Soil Formation

Soil is the product of the interaction of climate, parent material, plant and animal life, time, and topography. The relative importance of these factors differs from place to place. In some places one factor is dominant, and in other places another is dominant. The effect of any one of the soil-forming factors is modified to some degree by all the others.

Climate

The climate of Geneva County is warm and humid. Summers are long and hot. Winters are short and mild, and the ground rarely freezes to a depth of more than a few inches. The climate is fairly even throughout the county and accounts for few differences among the soils. Rainfall averages 54 inches a year.

A mild, humid climate such as this favors rapid decomposition of organic matter, and hastens chemical reaction in the soil. The plentiful rainfall leaches out large amounts of soluble bases and carries the less soluble fine particles downward; consequently, the soils are acid, sandy, and low in natural fertility. The structure of the subsoil is weak in the finer textured soils because the subsoil is seldom dry. The large amount of moisture and the warm temperature favor the growth of bacteria and fungi and speed the decomposition of organic matter. As a result, the soils are low in organic-matter content.

Parent material

The soils of Geneva County formed mainly in two kinds of material: marine sediment that has undergone considerable weathering in place and water-deposited material on stream terraces and flood plains. Soils that formed in weathered marine sediment include those of the Dothan, Esto, Orangeburg, and Red Bay series. Soils that formed in water-deposited material on stream terraces and flood plains include those of the Alpin, Bibb, Kalmia, and Leaf series.

Plant and animal life

Living organisms, both plant and animal, play an important role in soil formation. Animals continuously mix the soil material, and plant roots create channels through which air and moisture move. Organic matter affects the moisture and mineral content of the soil. Acids released by decomposition of organic matter alter the rate of chemical reaction.

The native vegetation on uplands was nearly pure stands of pine with scattered hardwoods. The stream terraces supported mixed stands of gum and other hardwoods and pine. Hardwoods were predominant on the flood plains, but there were also a few scattered pines.

Man's activities have had an important influence on the soils. He has cleared the land, stirred the soil, compacted it, added and removed mineral elements, added water by irrigation, and removed water by drainage. He has altered the plant cover and modified the kinds and numbers of animals.

Time

If all other factors of soil formation are equal, the degree of soil formation is in direct proportion to time. If soil-forming factors have been active for a long time, horizonation is stronger than if the same factors have been active for a relatively short time.

Geologically, most of the soils of Geneva County are fairly young. The youngest are the alluvial soils along streams. These soils receive deposits of sediment and are going through a cumulative soil-forming process. In most cases these young soils have very weakly defined horizons, mainly because of the short period of time soil-forming processes have been active.

The next youngest soils in the county are those on terraces of the Pea and Choctawhatchee Rivers. The material in which they formed was deposited by the rivers, but the river channels are now deeper, and overflow no longer reaches these soils. Many of these soils have fairly strong horizonation.

The oldest soils in the county are those on uplands. They formed in marine sediment that has undergone considerable weathering.

Topography

Topography influences the formation of soils through its effect on drainge, runoff, and erosion. In Geneva County the topography is nearly level to strongly sloping. The elevation ranges from 70 to 300 feet above sea level. Large flat areas and depressions are generally poorly drained, and soil formation is retarded by accumulated water, much of which is received as runoff from adjacent areas. As slope increases, runoff increases in intensity, less water is absorbed and becomes available to plants, and erosion accelerates. In places erosion nearly keeps pace with soil formation, and consequently, steep soils are generally shallow and weakly developed.

The direction of slope affects the microclimate. Soils that have slopes that face south or southwest warm up somewhat earlier in spring and generally reach a higher temperature each day than soils that face north. This results in accelerated chemical weathering. The soils that have north-facing slopes retain moisture longer because they are in shade for longer periods and the temperature is lower. Differences caused by the direction of slope are only slight in Geneva County and are of minor importance in the formation of the soils.

Classification of Soils

Soils are classified so that we can more easily remember their significant characteristics. Classification enables us to assemble knowledge about the soils, to see their relationship to one another and to the whole environment, and to develop principles that help us to

understand their behavior and their response to manipulation. First through classification, and then through use of soil maps, we can apply our knowledge of soils to specific fields and other tracts of land.

The narrow categories of classification, such as those used in detailed soil surveys, allow us to organize and apply knowledge about soils in managing farms, fields, and woodlands; in developing rural areas; in engineering work; and in many other ways. Soils are placed in broad classes to facilitate study and comparison in large areas such as countries and continents.

The system of soil classification currently used was adopted by the National Cooperative Soil Survey in 1965. Because this system is under continual study, readers interested in developments of the current system should search the latest literature available (*3, 8*).

The current system of classification has six categories. Beginning with the broadest, these categories are order, suborder, great group, subgroup, family, and series. In this system the criteria used as a basis for classification are soil properties that are observable and measurable. The properties are chosen, however, so that the soils of similar genesis, or mode of origin, are grouped. In table 9, the soil series of Geneva County are placed in four categories of the current system.

Classes of the current system are briefly defined in the following paragraphs.

ORDER.—Ten soil orders are recognized. The properties used to differentiate among soil orders are those that tend to give broad climatic groupings of soils. The two exceptions to this are the Entisols and Histosols, which occur in many different climates.

SUBORDER.—Each order is subdivided into suborders that are based primarily on those soil characteristics that seem to produce classes with the greatest genetic similarity. The suborders narrow the broad climatic range permitted in the orders. The soil properties used to separate suborders are mainly those that reflect either the presence or absence of waterlogging, or soil differences resulting from the climate or vegetation.

GREAT GROUP.—Soil suborders are separated into great groups on the basis of uniformity in the kinds and sequence of major soil horizons and features. The horizons used to make separations are those in which clay, iron, or humus have accumulated; those that have pans that interfere with growth of roots, movement of water, or both; and those that have thick, dark-colored surface horizons. The features used are the self-mulching properties of clay, soil temperature, major differences in chemical composition (mainly calcium, magnesium, sodium, and potassium), dark-red and dark-brown colors associated with basic rocks, and the like.

SUBGROUP.—Great groups are divided into subgroups, one representing the central (typic) segment of the group, and others called intergrades that have properties of the group and also one or more properties of another great group, suborder, or order.

FAMILY.—Soil families are separated within a subgroup primarily on the basis of properties important to the growth of plants or on the behavior of soils when used for engineering. Among the properties considered are texture, mineralogy, reaction, soil temperature, permeability, thickness of horizons, and consistence.

Climate [5]

Temperate with abundant, well-distributed rainfall describes the climate of Geneva County. Tables 10 through 15 give climatic data for Geneva County.

Summers are quite long with hot weather and high

[5] By ROBERT M. FERRY, climatologist for Alabama, National Weather Service, U.S. Department of Commerce.

TABLE 9.—*Soil series classified according to the current system*

Series	Family	Subgroup	Order
Alaga	Thermic, coated	Typic Quartzipsamments	Entisols.
Alpin	Thermic, coated	Typic Quartzipsamments	Entisols.
Ardilla	Fine-loamy, siliceous, thermic	Fragiaquic Paleudults	Ultisols.
Bibb	Coarse-loamy, siliceous, acid, thermic	Typic Fluvaquents	Entisols.
Bigbee	Thermic, coated	Typic Quartzipsamments	Entisols.
Bonifay	Loamy, siliceous, thermic	Grossarenic Plinthic Paleudults	Ultisols.
Byars	Clayey, kaolinitic, thermic	Umbric Paleaquults	Ultisols.
Chastain	Fine, mixed, acid, thermic	Typic Haplaquepts	Inceptisols.
Dothan	Fine-loamy, siliceous, thermic	Plinthic Paleudults	Ultisols.
Esto	Clayey, kaolinitic, thermic	Typic Paleudults	Ultisols.
Eunola	Fine-loamy, siliceous, thermic	Aquic Hapludults	Ultisols.
Fuquay	Loamy, siliceous, thermic	Arenic Plinthic Paleudults	Ultisols.
Grady	Clayey, kaolinitic, thermic	Typic Paleaquults	Ultisols.
Kalmia	Fine-loamy over sandy or sandy-skeletal, siliceous, thermic.	Typic Hapludults	Ultisols.
Leaf	Clayey, mixed, thermic	Typic Albaquults	Ultisols.
Lenoir	Clayey, mixed, thermic	Aeric Paleaquults	Ultisols.
Lucy	Loamy, siliceous, thermic	Arenic Paleudults	Ultisols.
Orangeburg	Fine-loamy, siliceous, thermic	Typic Paleudults	Ultisols.
Osier	Siliceous, thermic	Typic Psammaquents	Entisols.
Plummer	Loamy, siliceous, thermic	Grossarenic Paleaquults	Ultisols.
Rains	Fine-loamy, siliceous, thermic	Typic Paleaquults	Ultisols.
Red Bay	Fine-loamy, siliceous, thermic	Rhodic Paleudults	Ultisols.
Troup	Loamy, siliceous, thermic	Grossarenic Paleudults	Ultisols.

TABLE 10.—*Temperature data*

[All data from Geneva. The highest and lowest temperatures on record are taken from the period 1931–60]

Month	Average daily maximum	Average daily minimum	Mean	Highest on record	Lowest on record	Average number days maximum 90° F or higher	Average number days minimum 32° F or lower
	°F	°F	°F	°F	°F		
January	63.5	39.3	51.4	83	12	0	12
February	66.8	42.2	54.5	86	13	0	7
March	73.1	47.1	60.1	92	19	1	3
April	80.6	53.8	67.2	96	30	3	0
May	88.0	60.5	74.3	102	41	15	0
June	92.8	67.7	80.3	106	48	23	0
July	93.1	69.6	81.4	104	59	28	0
August	93.6	68.8	81.2	107	55	27	0
September	88.8	65.3	77.0	102	45	16	0
October	81.2	54.1	67.6	97	26	3	1
November	70.4	43.6	57.0	89	16	0	5
December	63.5	39.2	51.3	84	15	0	12
Year	79.6	54.3	66.9	107	12	116	40

TABLE 11.—*Precipitation data*

[Data for minimum and maximum amount are based on records at Dothan, Houston County, Alabama, for the period 1902–34. All other data are from Geneva]

Month	Average	Maximum monthly	Minimum monthly	Maximum in 24 hours	Average number of days that have .10 inch or more	Average number of days that have .50 inch or more
	Inches	*Inches*	*Inches*	*Inches*		
January	3.89	16.88	0.34	6.42	5	2
February	4.31	10.36	0.93	4.26	5	4
March	5.80	16.40	0.89	9.00	7	3
April	5.37	12.60	0.60	4.75	5	3
May	4.03	8.73	0.58	4.10	6	3
June	4.24	8.52	1.10	4.76	7	3
July	6.36	12.73	2.22	6.73	9	4
August	5.92	20.85	2.20	5.80	8	3
September	5.32	13.86	0.63	8.00	7	3
October	1.78	12.41	(1)	7.37	5	1
November	3.07	10.29	0.05	4.50	4	2
December	4.18	13.61	0.53	3.90	5	3
Year	54.27	20.85	(1)	9.00	73	34

[1] Trace.

humidity beginning in May and continuing, with very few breaks, until about late September. The average summer has about three or four days when the temperature reaches 100° F or higher. Temperatures of 90° or above are recorded on an average of 116 days per year.

Almost all summer rainfall is in the form of thundershowers. July has more days with thunderstorms than any other month. The stormiest season, however, is mainly in March and April. The chances of damaging windstorms or tornadoes are greater during this period, although such storms occur in all months. Even in the stormiest season, the chances of a tornado striking a particular home or farm are extremely low.

Thunderstorms occur in any month. There are about 75 to 80 days each year with thunderstorms, most of them in June, July, and August.

Autumn is the most pleasant season. Generally toward the end of September or early October, the first cool spells are noted. Precipitation drops off considerably, humidity is much lower, and the percentage of possible sunshine is higher. This pleasant weather continues through October into November, when colder temperatures arrive at about the same time as an increase in rainfall.

Winter in Geneva County is generally relatively mild, and extended periods of severe cold are rare. The temperature drops to freezing or lower about 40 times in an average winter. It drops to 20° F or lower only on one or two days. Even during a severe cold wave, it is rare for the temperature to remain below freezing all day.

TABLE 12.—*Average dates of occurrence of selected freezing temperatures*

[All data from Geneva]

	32° F or below	28° F or below	20° F or below
Last minimum temperature	March 21	February 16	January 15
First minimum temperature	November 11	November 28	December 18
Number of days between dates	235	285	337

TABLE 13.—*Average number of hours per month in which temperature is 45° or lower*

[Data based on records at Dothan, Houston County, Alabama]

Month	Number of hours
January	228
February	181
March	99
April	15
May	0
June	0
July	0
August	0
September	0
October	11
November	145
December	271
Year	950

TABLE 14.—*Probabilities of occurrence of selected temperatures in spring and fall*

[Data based on records at Dothan, Houston County, Alabama. Absence of data indicates that data are not available]

Probability	Dates for given probability and temperature						
	40° F or less	36° F or less	32° F or less	28° F or less	24° F or less	20° F or less	16° F or less
Spring:							
1 year in 10 later than	April 16	April 10	March 26	March 5	March 4	February 16	February 7
2 years in 10 later than	April 14	April 6	March 19	March 3	February 22	February 9	January 22
5 years in 10 later than	April 2	March 22	March 2	February 11	January 14		
Fall:							
1 year in 10 earlier than	October 19	October 28	November 4	November 16			
2 years in 10 earlier than	October 26	October 30	November 8	November 20			
5 years in 10 earlier than	October 30	November 7	November 25	December 1	December 12		

TABLE 15.—*Probabilities of occurrence of extremes of temperature and precipitation*

[Data based on records at Dothan, Houston County, Alabama]

Month	Temperature		Precipitation	
	Two years in 10 will have at least 4 days with—		One year in 10 will have—	
	Maximum temperature equal to or higher than—	Minimum temperature equal to or lower than—	Less than—	More than—
	°F	°F	*Inches*	*Inches*
January	76	25	1.3	7.1
February	80	28	1.6	9.2
March	83	33	2.4	11.5
April	88	43	1.1	8.0
May	95	52	.9	5.2
June	98	63	1.8	7.2
July	97	68	2.4	9.8
August	98	66	2.2	7.2
September	95	57	2.3	9.2
October	88	42	.5	3.4
November	82	31	.7	6.6
December	77	28	2.0	9.0
Year	[1] 100	[2] 19	37.2	68.6

[1] Average annual highest temperature.

[2] Average annual lowest temperature.

The lowest temperature in Geneva County in recent times was probably about -4° F on February 13, 1899. No official weather records are available for Geneva County for that time; but at Newton in Dale County, temperature was -5° and at Elba in Coffee County. -7°.

In an average year, any one location in Geneva County will receive measurable rainfall on about 73 days. About 34 days will have ½ inch or more, and 16 days will have one inch or more. These figures vary considerably from year to year, however.

The disastrous drought of 1954 was the worst on record. In Geneva County, less than half the normal rainfall was received that year, and all 12 months were drier than normal. Total precipitation for the year was 26.13 inches. From September through November, a sparse 3.96 inches fell—only 41 percent of normal. From September 30 to November 12 in 1939, there was no measurable rain in Dothan in adjacent Houston County. Less severe droughts occur only about once or twice every 10 years.

By definition, a drought occurs when there is no water in the soil available to plants. The frequency and severity of drought depend on the capacity of the soil to hold available moisture, on precipitation, and on the amount of water used or transpired by plants. Even in a normal year, there are periods when rainfall does not meet the needs of most crops. Thus, in most years, supplementary irrigation is needed for maximum crop production in most parts of the State. During a severe drought, however, the supply of water for irrigation is likely to be limited or nonexistent.

Wind and humidity records are not available for Geneva County, but records from the nearby station at Dothan, in Houston County, show that the prevailing wind is from the southwest and the average speed is 7.8 miles per hour. March is the windiest month; winds average 10 miles per hour. Strong winds usually last only a brief time, and dangerous winds are rare.

The average relative humidity at noon ranges from 55 percent in spring to 65 percent in winter. At 6 a.m., it ranges from 88 percent in spring to 94 percent in summer. The average hourly humidity for the entire year is about 75 percent. As a rule, the lowest humidity occurs around 3 p.m., and the highest, about 6 a.m.

For the year as a whole, the sun shines about 64 percent of the daylight hours. It varies from near 48 percent in December to a maximum of 73 percent in May.

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Glossary

Alluvium. Soil material, such as sand, silt, or clay, that has been deposited on land by streams.

Available water capacity (also termed available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material, and tends to stretch somewhat and pull apart, rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard and brittle; little affected by moistening.

Drainage class (natural). Refers to the conditions of frequency and duration of periods of saturation or partial saturation that existed during the development of the soil, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven different classes of natural soil drainage are recognized.

Excessively drained soils are commonly very porous and rapidly permeable and have a low available water capacity.

Somewhat excessively drained soils are also very permeable and are free from mottling throughout their profile.

Well-drained soils are nearly free from mottling and are commonly of intermediate texture.

Moderately well drained soils commonly have a slowly permeable layer in or immediately beneath the solum. They have uniform color in the A and upper B horizons and mottling in the lower B and the C horizons.

Somewhat poorly drained soils are wet for significant periods but not all the time, and some soils commonly have mottling at a depth below 6 to 16 inches.

Poorly drained soils are wet for long periods and are light gray and generally mottled from the surface downward, although mottling may be absent or nearly so in some soils.

Very poorly drained soils are wet nearly all the time. They have a dark-gray or black surface layer and are gray or light gray, with or without mottling, in the deeper parts of the profile.

Erosion. The wearing away of the land surface by wind (sandblast), running water, and other geological agents.

Fertility, soil. The quality of a soil that enables it to provide compounds, in adequate amounts and in proper balance, for the growth of specified plants, when other growth factors

such as light, moisture, temperature, and the physical condition of the soil are favorable.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Forest type. A term used to describe stands that are similar in composition and development because of ecological factors. A forest type is temporary if its character has been caused by logging, fire, or other passing influences; it is permanent if no appreciable change is expected and its character is the result of ecological factors alone.

Fragipan. A loamy, brittle, subsurface horizon that is very low in organic-matter content and clay but is rich in silt or very fine sand. The layer is seemingly cemented. When dry, it is hard or very hard and has a high bulk density in comparison with the horizon or horizons above it. When moist, the fragipan tends to rupture suddenly if pressure is applied, rather than to deform slowly. The layer is generally mottled, is slowly or very slowly permeable to water, and has few or many bleached fracture planes that form polygons. Fragipans are a few inches to several feet thick; they generally occur below the B horizon, 15 to 40 inches below the surface.

Genesis, soil. The manner in which a soil originates. Refers especially to the processes initiated by climate and organisms that are responsible for the development of the solum, or true soil, from the unconsolidated parent material, as conditioned by relief and age of landform.

Gravelly soil material. From 15 to 50 percent of material, by volume, consists of rounded or angular rock fragments that are not prominently flattened and are as much as 3 inches in diameter.

Green-manure crop. A crop grown for the purpose of being turned under in an early stage of maturity or soon after maturity for soil improvement.

Horizon, soil. A layer of soil, approximately parallel to the surface, that has distinct characteristics produced by soil-forming processes. These are the major horizons:

O horizon.—The layer of organic matter on the surface of a mineral soil. This layer consists of decaying plant residues.

A horizon.—The mineral horizon at the surface or just below an O horizon. This horizon is the one in which living organisms are most active and therefore is marked by the accumulation of humus. The horizon may have lost one or more of soluble salts, clay, and sesquioxides (iron and oxides).

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of change from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics caused (1) by accumulation of clay, sesquioxides, humus, or some combination of these; (2) by prismatic or blocky structure; (3) by redder or stronger colors than the A horizon; or (4) by some combination of these. Combined A and B horizons are usually called the solum, or true soil. If a soil lacks a B horizon, the A horizon alone is the solum.

C horizon.—The weathered rock material immediately beneath the solum. In most soils this material is presumed to be like that from which the overlying horizons were formed. If the material is known to be different from that in the solum, a Roman numeral precedes the letter C.

R layer.—Consolidated rock beneath the soil. The rock usually underlies a C horizon but may be immediately beneath an A or B horizon.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are—

Furrow.—Water is applied in small ditches made by cultivation implements used for tree and row crops.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Leaching. The removal of soluble materials from soils or other material by percolating water.

Mottling, soil. Irregularly marked with spots of different colors that vary in number and size. Mottling in soils usually indicates poor aeration and lack of drainage. Descriptive terms are as follows: abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent.* The size measurements are these: *fine,* less than 5 millimeters (about 0.2 inch) in diameter along the greatest dimension; *medium,* ranging from 5 millimeters to 15 millimeters (about 0.2 to 0.6 inch) in diameter along the greatest dimension; and *coarse,* more than 15 millimeters (about 0.6 inch) in diameter along the greatest dimension.

Permeability. The quality that enables the soil to transmit water or air. Terms used to describe permeability are as follows: *very slow, slow, moderately slow, moderate, moderately rapid, rapid, and very rapid.*

Profile, soil. A vertical section of the soil through all its horizons and extending into the parent material.

Reaction, soil. The degree of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is precisely neutral in reaction because it is neither acid nor alkaline. An acid, or "sour," soil is one that gives an acid reaction; an alkaline soil is one that is alkaline in reaction. In words, the degrees of acidity or alkalinity are expressed thus:

	pH		pH
Extremely acid	Below 4.5	Neutral	6.6 to 7.3
Very strongly acid	4.5 to 5.0	Mildly alkaline	7.4 to 7.8
Strongly acid	5.1 to 5.5	Moderately alkaline	7.9 to 8.4
Medium acid	5.6 to 6.0	Strongly alkaline	8.5 to 9.0
Slightly acid	6.1 to 6.5	Very strongly alkaline	9.1 and higher

Relief. The elevations or inequalities of a land surface, considered collectively.

Sand. Individual rock or mineral fragments in a soil that range in diameter from 0.05 to 2.0 millimeters. Most sand grains consist of quartz, but they may be of any mineral composition. The textural class name of any soil that contains 85 percent or more sand and not more than 10 percent clay.

Silt. Individual mineral particles in a soil that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). Soil of the silt textural class is 80 percent or more silt and less than 12 percent clay.

Soil. A natural, three-dimensional body on the earth's surface that supports plants and that has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Solum. The upper part of a soil profile, above the parent material, in which the processes of soil formation are active. The solum in mature soil includes the A and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and other plant and animal life characteristic of the soil are largely confined to the solum.

Structure, soil. The arrangement of primary soil particles into compound particles or clusters that are separated from adjoining aggregates and have properties unlike those of an equal mass of unaggregated primary soil particles. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular. Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering together without any regular cleavage, as in many claypans and hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that it may soak into the soil or flow slowly to a prepared outlet without harm. Terraces in fields are generally built so they can be farmed. Terraces intended mainly for drainage have a deep channel that is maintained in permanent sod.

Terrace (geological). An old alluvial plain, ordinarily flat or undulating, bordering a river, lake, or the sea. Stream terraces are frequently called second bottoms, as contrasted to flood plains, and are seldom subject to overflow. Marine terraces were deposited by the sea and are generally wide.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay.* The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Tilth, soil. The condition of the soil in relation to the growth of plants, especially soil structure. Good tilth refers to the friable state and is associated with high noncapillary porosity and stable, granular structure. A soil in poor tilth is nonfriable, hard, nonaggregated, and difficult to till.

Topsoil. A presumed fertile soil or soil material, or one that responds to fertilization, ordinarily rich in organic matter, used to topdress roadbanks, lawns, and gardens.

GUIDE TO MAPPING UNITS

For complete information about a mapping unit, read both the description of the mapping unit and that of the soil series to which the mapping unit belongs. The suitability and management of the soils for specific crops and pasture are discussed at the mapping unit level. Overall management practices for cropland and grassland are described in the section "Management for Crops and Pasture." For complete information about a capability unit, read the introduction to "Management for Crops and Pasture" and a discussion of the capability unit in that section. When referring to a woodland suitability group, read the introduction to its section for general information about its management.

*A low intensity mapping unit. The composition of these units is more variable than that of others in the county, but management of the soils has been controlled well enough that reliable interpretations can be made.

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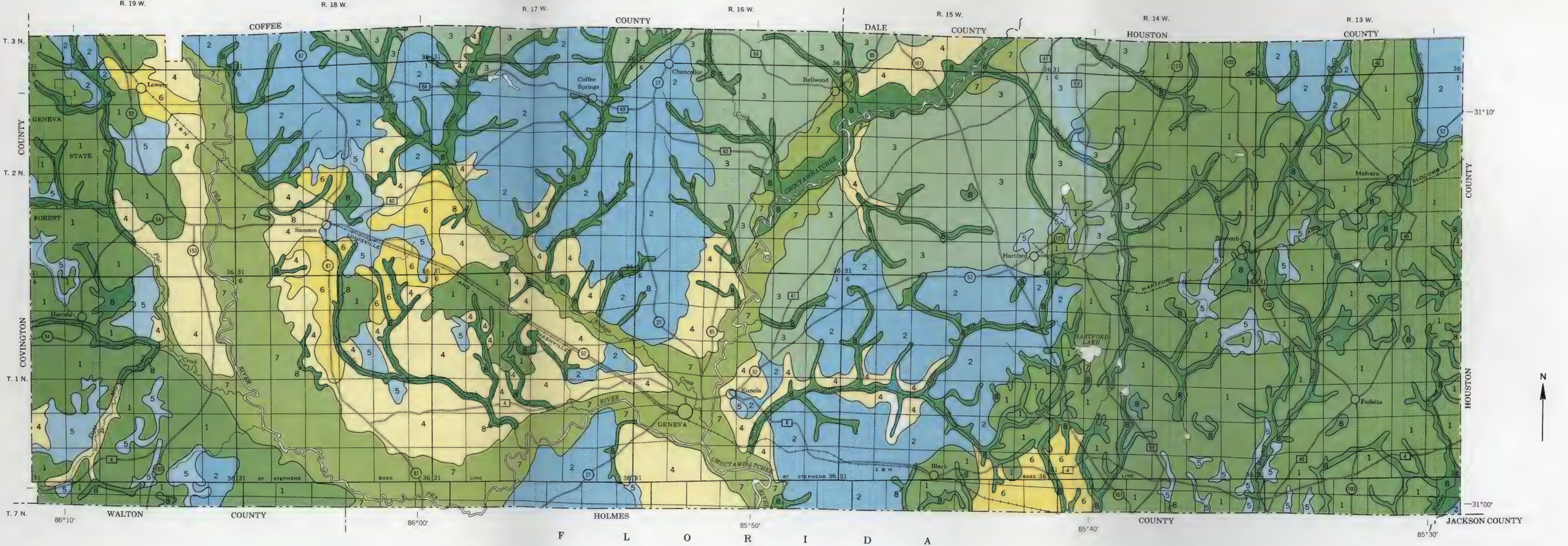


SOIL ASSOCIATIONS

1. Dothan association: Deep, well drained or moderately well drained, gently sloping soils that contain plinthite at depths of 24 to 50 inches; on uplands
2. Dothan-Orangeburg association: Deep, well drained or moderately well drained, gently sloping soils, some contain plinthite at depths of 24 to 50 inches; on uplands
3. Orangeburg-Red Bay association: Deep, well drained, gently sloping to undulating soils; on uplands
4. Bonifay-Alaga-Troup association: Deep, well drained to somewhat excessively drained, nearly level to gently sloping soils that have loamy sand or sand more than 40 inches thick; on uplands
5. Ardilla association: Deep, somewhat poorly drained, nearly level soils that contain plinthite at depths of 20 to 38 inches; on uplands
6. Fuquay association: Deep, well drained, nearly level to gently sloping soils that have loamy sand to a depth of 21 to 38 inches and that contain plinthite at depths of 23 to 50 inches; on uplands
7. Kalmia-Eunola-Alpin association: Deep, moderately well drained to excessively drained, nearly level soils, some are subject to flooding; on stream terraces
8. Bibb-Osier association: Deep, poorly drained and very poorly drained, nearly level soils; on flood plains

Compiled 1975

Each area outlined on this map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.

SECTIONALIZED TOWNSHIP

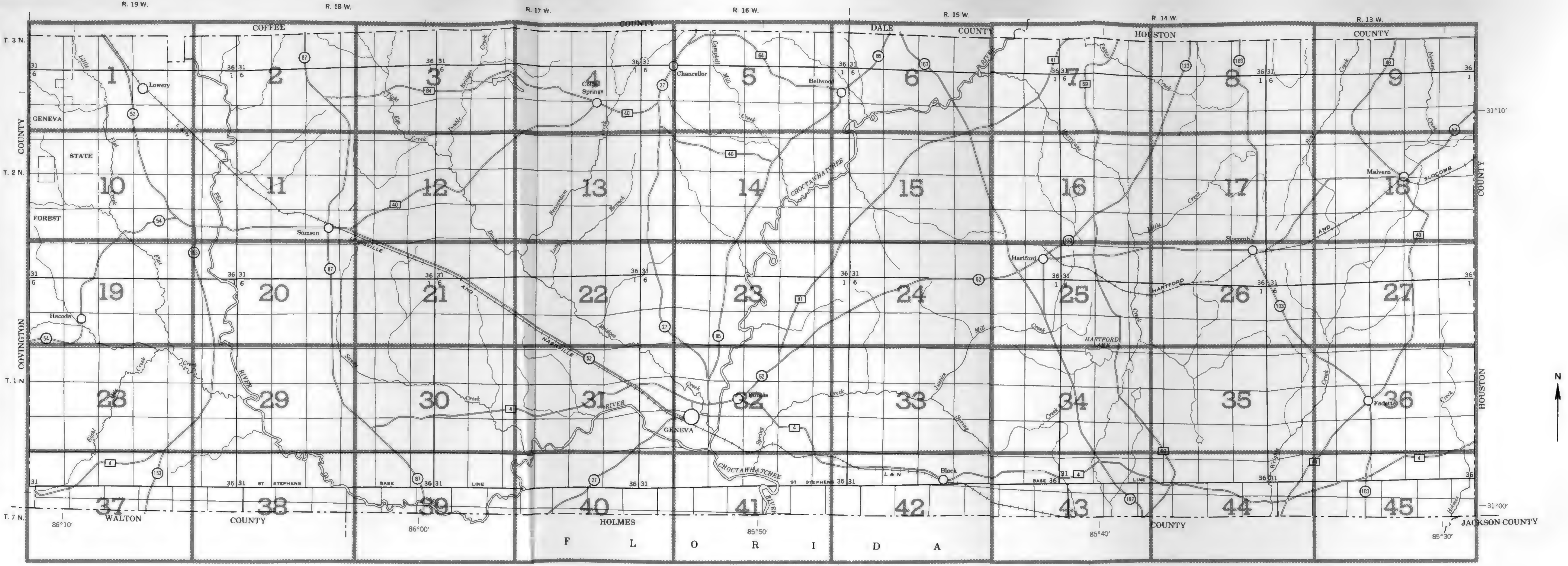
6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
ALABAMA AGRICULTURAL EXPERIMENT STATION AND
ALABAMA DEPARTMENT OF AGRICULTURE AND INDUSTRIES

GENERAL SOIL MAP

GENEVA COUNTY, ALABAMA

1 0 1 2 3 4 Miles



SECTIONALIZED TOWNSHIP

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

INDEX TO MAP SHEETS
GENEVA COUNTY, ALABAMA

CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

CULTURAL FEATURES

BOUNDARIES

- National, state or province
- County or parish
- Minor civil division
- Reservation (national forest or park, state forest or park, and large airport)
- Land grant
- Limit of soil survey (label)
- Field sheet matchline & neatline

AD HOC BOUNDARY (label)

- Small airport, airfield, park, oilfield, cemetery, or flood pool (Davis Airstrip; FLOOD POOL LINE)

STATE COORDINATE TICK

LAND DIVISION CORNERS (sections and land grants)

ROADS

- Divided (median shown if scale permits)
- Other roads
- Trail

ROAD EMBLEMS & DESIGNATIONS

- Interstate (78)
- Federal (410)
- State (52)
- County, farm or ranch (378)

RAILROAD

POWER TRANSMISSION LINE (normally not shown)

PIPE LINE (normally not shown)

FENCE (normally not shown)

LEVEES

- Without road
- With road
- With railroad

DAMS

- Large (to scale)
- Medium or small (water; w)

PITS

- Gravel pit
- Mine or quarry

MISCELLANEOUS CULTURAL FEATURES

- Farmstead, house (omit in urban areas)
- Church
- School
- Indian mound (label) (Indian Mound)
- Located object (label) (Tower)
- Tank (label) (GAS)
- Wells, oil or gas
- Windmill
- Kitchen midden

WATER FEATURES

DRAINAGE

- Perennial, double line
- Perennial, single line
- Intermittent
- Drainage end
- Canals or ditches
  - Double-line (label) (CANAL)
  - Drainage and/or irrigation

LAKES, PONDS AND RESERVOIRS

- Perennial (water; w)
- Intermittent (int; i)

MISCELLANEOUS WATER FEATURES

- Marsh or swamp
- Spring
- Well, artesian
- Well, irrigation
- Wet spot

SPECIAL SYMBOLS FOR SOIL SURVEY

SOIL DELINEATIONS AND SYMBOLS (CeA; FoB2)

ESCARPMENTS

- Bedrock (points down slope)
- Other than bedrock (points down slope)

SHORT STEEP SLOPE

GULLY

DEPRESSION OR SINK

SOIL SAMPLE SITE (normally not shown)

MISCELLANEOUS

- Blowout
- Clay spot
- Gravelly spot
- Gumbo, slick or scabby spot (sodic)
- Dumps and other similar non soil areas
- Prominent hill or peak
- Rock outcrop (includes sandstone and shale)
- Saline spot
- Sandy spot
- Severely eroded spot
- Slide or slip (tips point upslope)
- Stony spot, very stony spot
- Borrow pit (B.P.)
- Sand pit (S.P.)

SOIL LEGEND

The first letter, always a capital is the initial letter of the soil name. The second letter is a capital if the mapping unit is broadly defined 1/; otherwise, it is a small letter. The third letter, always a capital, shows the slope class. Symbols without slope letters are those of nearly level soils.

SYMBOL	NAME
AaB	Alaga loamy sand, 0 to 5 percent slopes
ApA	Alpin sand, 0 to 3 percent slopes
ArA	Ardilla sandy loam, 0 to 2 percent slopes
Bb	Bibb and Osier soils, frequently flooded
BK	Bigbee-Kalmia-Eunola association
BoB	Bonifay loamy sand, 0 to 5 percent slopes
By	Byars soils, ponded
CB	Chastain and Bibb soils
DoA	Dothan sandy loam, 0 to 2 percent slopes
DoB	Dothan sandy loam, 2 to 5 percent slopes
DoC	Dothan sandy loam, 5 to 8 percent slopes
EsB	Esto loamy sand, 2 to 5 percent slopes
EsC	Esto loamy sand, 5 to 12 percent slopes
Eu	Eunola sandy loam
FuB	Fuquay loamy sand, 1 to 5 percent slopes
Gr	Grady silt loam
KaA	Kalmia loamy sand, 0 to 3 percent slopes
Le	Leaf-Lenoir complex
LuB	Lucy loamy sand, 0 to 5 percent slopes
OrA	Orangeburg sandy loam, 0 to 2 percent slopes
OrB	Orangeburg sandy loam, 2 to 5 percent slopes
OrC	Orangeburg sandy loam, 5 to 8 percent slopes
Pm	Plummer loamy sand
Ra	Rains sandy loam
RbA	Red Bay sandy loam, 0 to 2 percent slopes
RbB	Red Bay sandy loam, 2 to 5 percent slopes
RbC	Red Bay sandy loam, 5 to 8 percent slopes
RsD	Red Bay loamy sand, 8 to 12 percent slopes
TrB	Troup loamy sand, 0 to 5 percent slopes
TrC	Troup loamy sand, 5 to 12 percent slopes

1/ The composition of these units is more variable than that of others in the survey but has been controlled well enough to be interpreted for the expected use of the soils.

GENEVA COUNTY, ALABAMA — SHEET NUMBER 1

GENEVA COUNTY, ALABAMA NO. 1

COFFEE COUNTY

COVINGTON COUNTY

R. 19 E.

T. 2 N.

T. 3 N.

GENEVA STATE FOREST

Pilgrims Rest Church

Weeks Fishpond

Lowery

Triangle Branch

Flatt Creek

Bear Branch

Scrapstone Branch

Louisville and Nashville

(Joins sheet 2)

(Joins sheet 10)

N

1 Mile

5000 Feet

Scale 1:20000

GENEVA COUNTY, ALABAMA — SHEET NUMBER 2

2

N

1 Mile

5000 Feet

Scale · 1:20000

(Joins sheet 1)

COFFEE COUNTY

R. 19 E. | R. 20 E.

T. 2 N. | T. 3 N.

(Joins sheet 3)

(Joins sheet 11)

GENEVA COUNTY, ALABAMA NO. 2

GENEVA COUNTY, ALABAMA — SHEET NUMBER 3

GENEVA COUNTY, ALABAMA NO. 3

R 20 E | R 21 E

T. 2 N. | T. 3 N.

COFFEE COUNTY

Beaverdam Creek

Eje Creek

Tight Holly Branch

Bull Branch

Bridges Creek

Double Creek

Mt. Carmel Church

Shady Grove Church

Geneva County Lake

water

(Joins sheet 2)

(Joins sheet 4)

(Joins sheet 12

N

1 Mile

5000 Feet

Scale 1:20000

GENEVA COUNTY, ALABAMA — SHEET NUMBER 4

(4)

N

R. 21 E. | R. 22 E.

T. 2 N. | T. 3 N.

COFFEE COUNTY

1 Mile

5000 Feet

0

Scale · 1:20000

(Joins sheet 3)

(Joins sheet 5)

(Joins sheet 13)

Geneva County

Coffee Springs

Chancellor

El Bethel Church

Bull Branch

Lake

Beaverdam Creek

Beaverdam

33 34 35 36 31

4 3 2 1 6

9 10 11 12 7

GENEVA COUNTY, ALABAMA NO. 4

GENEVA COUNTY, ALABAMA — SHEET NUMBER 5

R. 22 E.

COFFEE COUNTY

T 2 N.

T 3 N.

(Joins sheet 4)

(Joins sheet 6)

(Joins sheet 14)

New Hope Church

Tramp Church

Chancellor

Lake Fox

Lake Jeanette

Campbell Creek

Mill Creek

Maulding Creek

Austin Branch

Bell Creek

Bronson Creek

Scale · 1:20000

1 Mile

5000 Feet

N

GENEVA COUNTY, ALABAMA NO. 5

GENEVA COUNTY, ALABAMA — SHEET NUMBER 6

R. 22 E. | R. 23 E.

N

Scale 1:20000

1 Mile
5000 Feet

(Joins sheet 5)

(Joins sheet 7)

(Joins sheet 15)

T. 2 N. | T. 3 N.

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land lines on corners, if shown, are approximately positioned.

GENEVA COUNTY, ALABAMA NO. 6

GENEVA COUNTY, ALABAMA — SHEET NUMBER 7

R. 23 E. | R. 24 E.

7

N

DALE COUNTY

HOUSTON COUNTY

CHOCTAWHATCHEE RIVER

Hurricane Creek

Posey Hollow

Bethel Church

Sandy Branch

(Joins sheet 6)

(Joins sheet 8)

(Joins sheet 16)

T. 3 N.

T. 2 N.

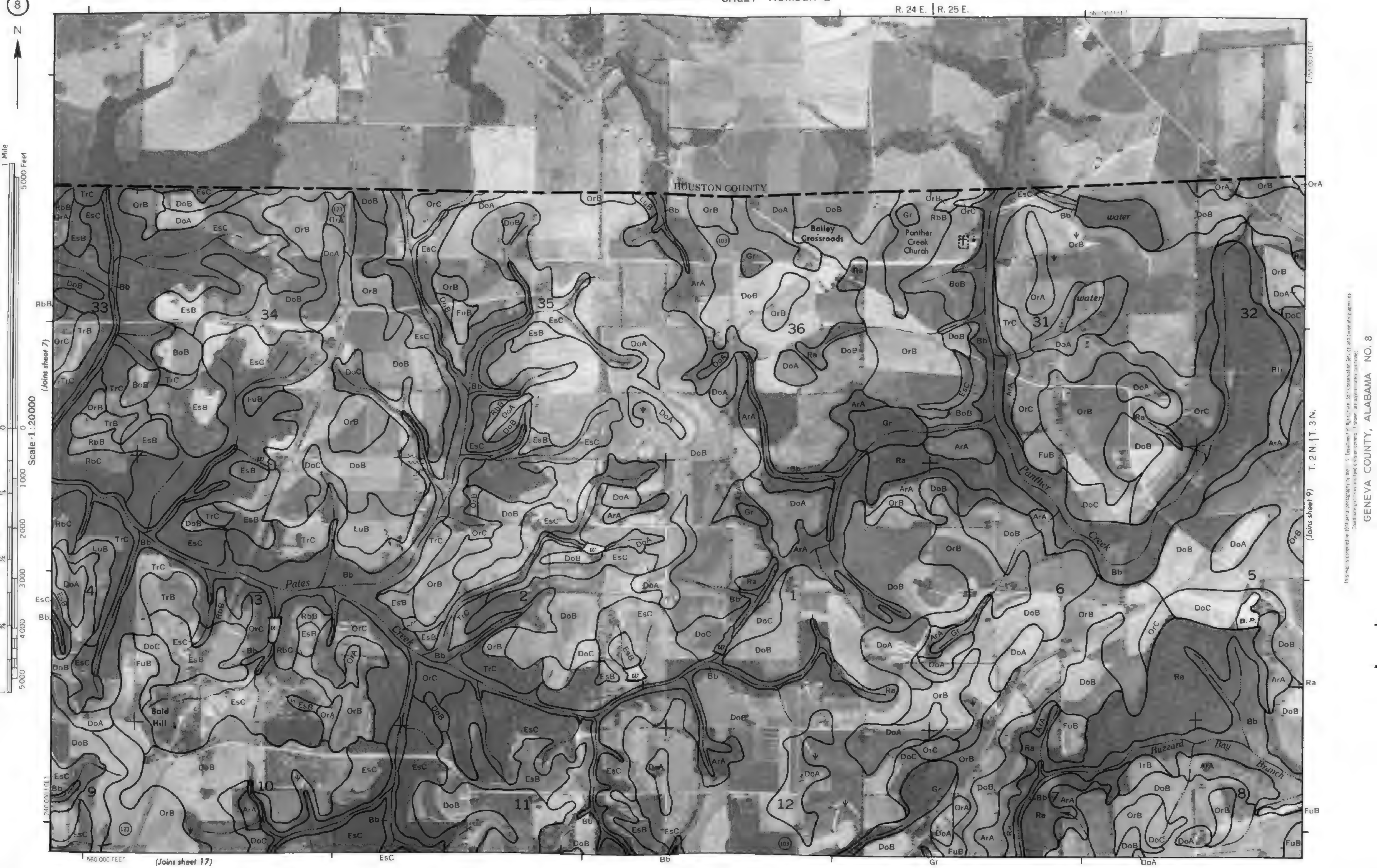
1 Mile

5000 Feet

Scale 1:20000

GENEVA COUNTY, ALABAMA NO. 7

This map compiled on 1974 aerial photography by the U. S. Department of Agriculture Soil Conservation Service and cooperating agencies
Coordinate grid ticks and land division corners, if shown, are approximately plotted


8
N
Scale 1:20000
1 Mile
5000 Feet
R. 24 E. | R. 25 E.
HOUSTON COUNTY
Bailey Crossroads
Panther Creek Church
Pales Creek
Panther Creek
Buzzard Bay Branch
Bald Hill
water
T. 2 N. | T. 3 N.
(Joins sheet 7)
(Joins sheet 9)
(Joins sheet 17)
560 000 FEET
33
34
35
36
31
32
1
2
3
4
5
6
7
8
9
10
11
12
GENEVA COUNTY, ALABAMA NO. 8

GENEVA COUNTY, ALABAMA NO. 9

GENEVA COUNTY, ALABAMA — SHEET NUMBER 10

10

N

1 Mile

5000 Feet

COVINGTON COUNTY

(Joins sheet 1)

R 19 E

GENEVA STATE FOREST

Indian Branch

Panther Creek

Faulk Mill Creek

Flat Creek Church

Oak Ridge Church

(Joins sheet 19)

(Joins sheet 11)

T. 2 N

GENEVA COUNTY, ALABAMA NO. 10

GENEVA COUNTY, ALABAMA — SHEET NUMBER 11

GENEVA COUNTY, ALABAMA NO. 11

R. 19 E. | R. 20 E.

T. 2 N.

(Joins sheet 2)

(Joins sheet 10)

(Joins sheet 12)

(Joins sheet 20)

11

N

1 Mile

5000 Feet

Scale 1:20000

RIVER

LAND

Mill Creek

Faulk

Tiger Branch

Lake Frankie

PEA

Bee Branch

LOUISVILLE AND NASHVILLE

Samson Branch

Spivey Tabernacle

Elton Church

Oak Ridge Church

Freewill Church

Travelers Rest Church

SAND PIT

SAMSON

GENEVA COUNTY, ALABAMA — SHEET NUMBER 12

12

N

R. 20 E. | R. 21 E.

(Joins sheet 3)

(Joins sheet 13)

(Joins sheet 11)

(Joins sheet 21)

T. 2 N.

1 Mile

5000 Feet

Scale 1:20000

Tight Creek

Rye Creek

Roundabout

water

Sellersville

Double Creek

Bridges

water

Creek

DoB OrB TrC Bb ArA Pm OrC TrB DoA By Ra OrA FuB AaB BoB LuB RsD Eu Le KaA RbB EsC ApA RbC BdB

10 11 12 7 8 9 15 14 13 18 17 16 22 23 24 19 20 21 27 26 25 30 29 28

N

R 21 E. | R 22 E.

(Joins sheet 4)

(Joins sheet 12)

(Joins sheet 14)

(Joins sheet 22)

Pleasant Valley Church

Eden Church

Beaverdam Creek

Long Branch

Rocky Creek

1 Mile

5000 Feet

Scale 1:20000

GENEVA COUNTY, ALABAMA NO. 13

GENEVA COUNTY, ALABAMA — SHEET NUMBER 14

(14)

N

R. 22 E.

R. 23 E.

T. 2 N.

(Joins sheet 5)

(Joins sheet 13)

(Joins sheet 23)

(Joins sheet 15)

1 Mile

5,000 Feet

Scale 1:20000

Muddin Creek

Austin Trc

Providence Creek

Ferry Branch

South Branch

Adams Creek

CHOCTAWHATCHEE RIVER

water

GENEVA COUNTY, ALABAMA NO. 14

GENEVA COUNTY, ALABAMA — SHEET NUMBER 15

GENEVA COUNTY, ALABAMA NO. 15

R 22 E | R 23 E

T 2 N

(Joins sheet 14)

(Joins sheet 6)

(Joins sheet 16)

(Joins sheet 24)

CHOCTAWHATCHEE RIVER

Barnes Creek

Roaring Creek

Antioch Church

St. Paul Church

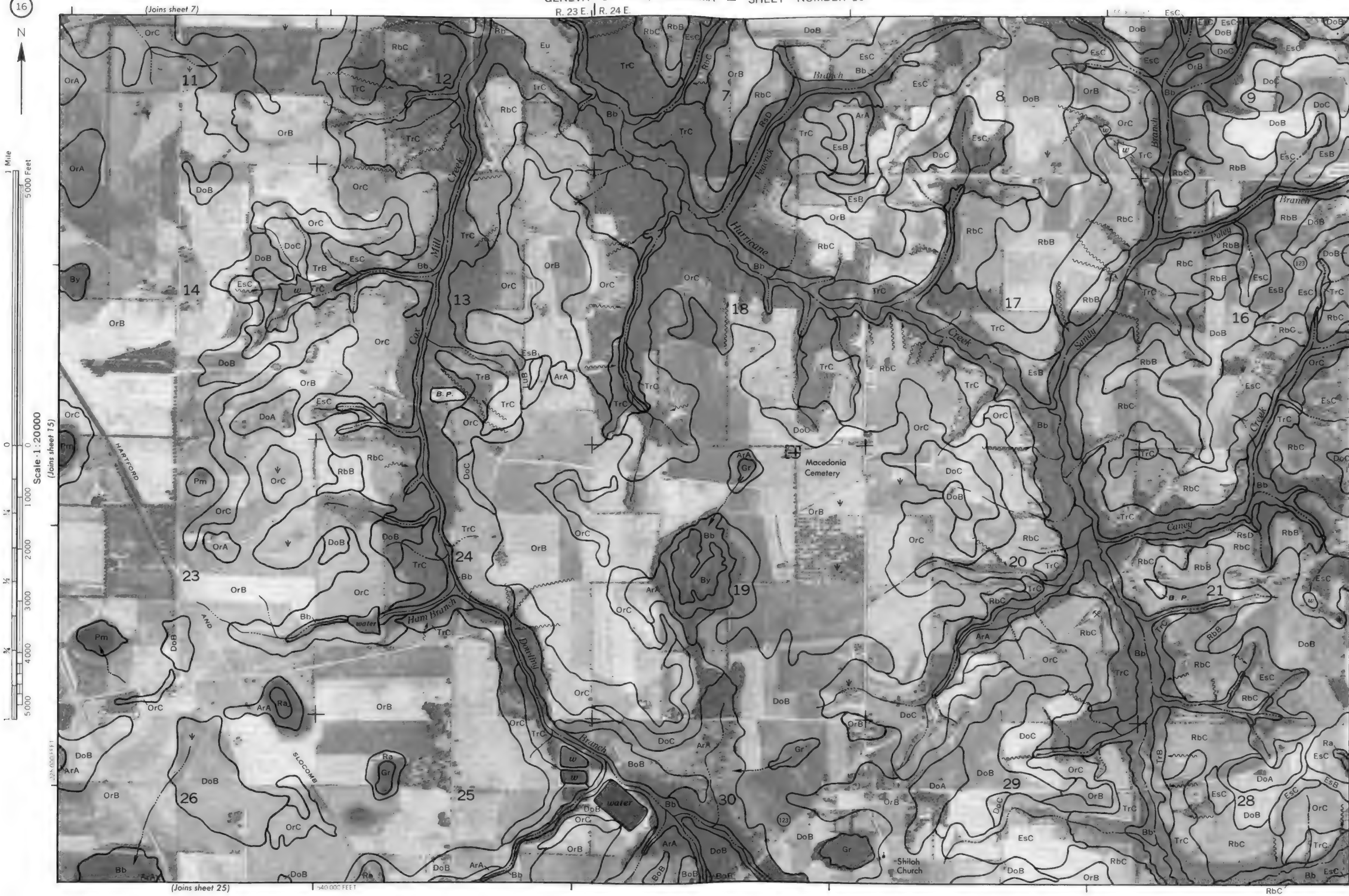
Fellowship Church

Westley Chapel

N

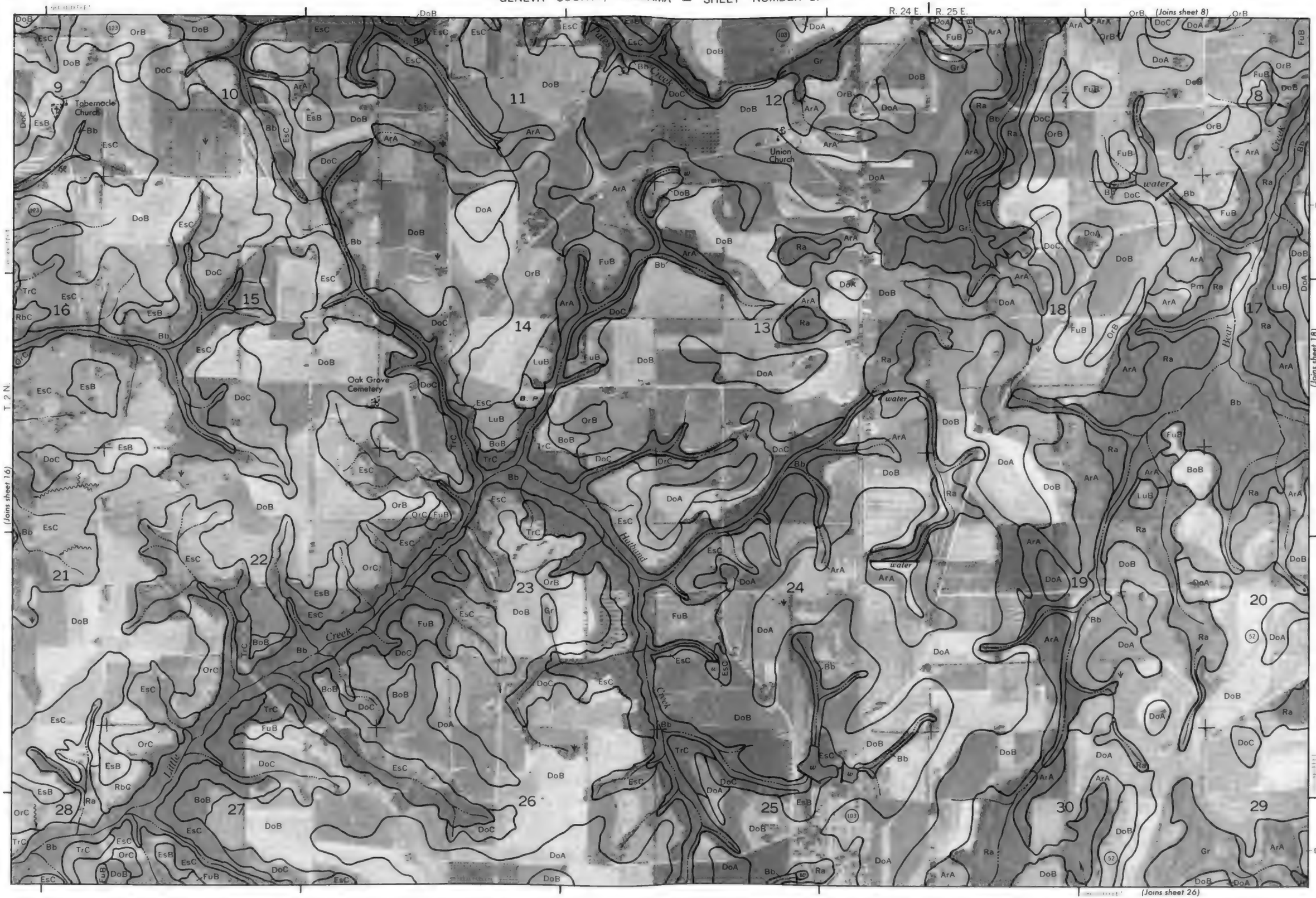
1 Mile 5000 Feet

Scale 1:20000


16
N
(Joins sheet 7)
R. 23 E. | R. 24 E.
(Joins sheet 15)
(Joins sheet 17)
(Joins sheet 25)
T. 2 N.
Scale 1:20000
1 Mile
5000 Feet
0
1000
2000
3000
4000
5000
Mill Creek
Cox
Hurricane
Peacock Branch
Sandy Creek
Poley Branch
Caney Creek
Ham Branch
Dowling Branch
Macedonia Cemetery
Shiloh Church
HARTFORD AND SLOCOMB
B. P.
water
123
11
12
7
8
9
13
14
18
17
16
23
24
19
20
21
26
25
30
29
28
OrC
OrB
OrA
DoB
DoC
DoA
RbC
RbB
TrC
TrB
EsC
EsB
Bb
By
Pm
Eu
RsD
ArA
Gr
Ra
BoB

GENEVA COUNTY, ALABAMA — SHEET NUMBER 17

GENEVA COUNTY, ALABAMA NO. 17



17

N

1 Mile

5,000 Feet

Scale 1:20000

GENEVA COUNTY, ALABAMA — SHEET NUMBER 18

18

N

1 Mile

5000 Feet

Scale · 1:20000

R. 25 E.

T. 2 N.

(Joins sheet 9)

(Joins sheet 17)

(Joins sheet 27)

Bethlehem Ch

Malvern School

Malvern

Bear Creek

Jack Ward Branch

SLOCOMB AND HARTFORD

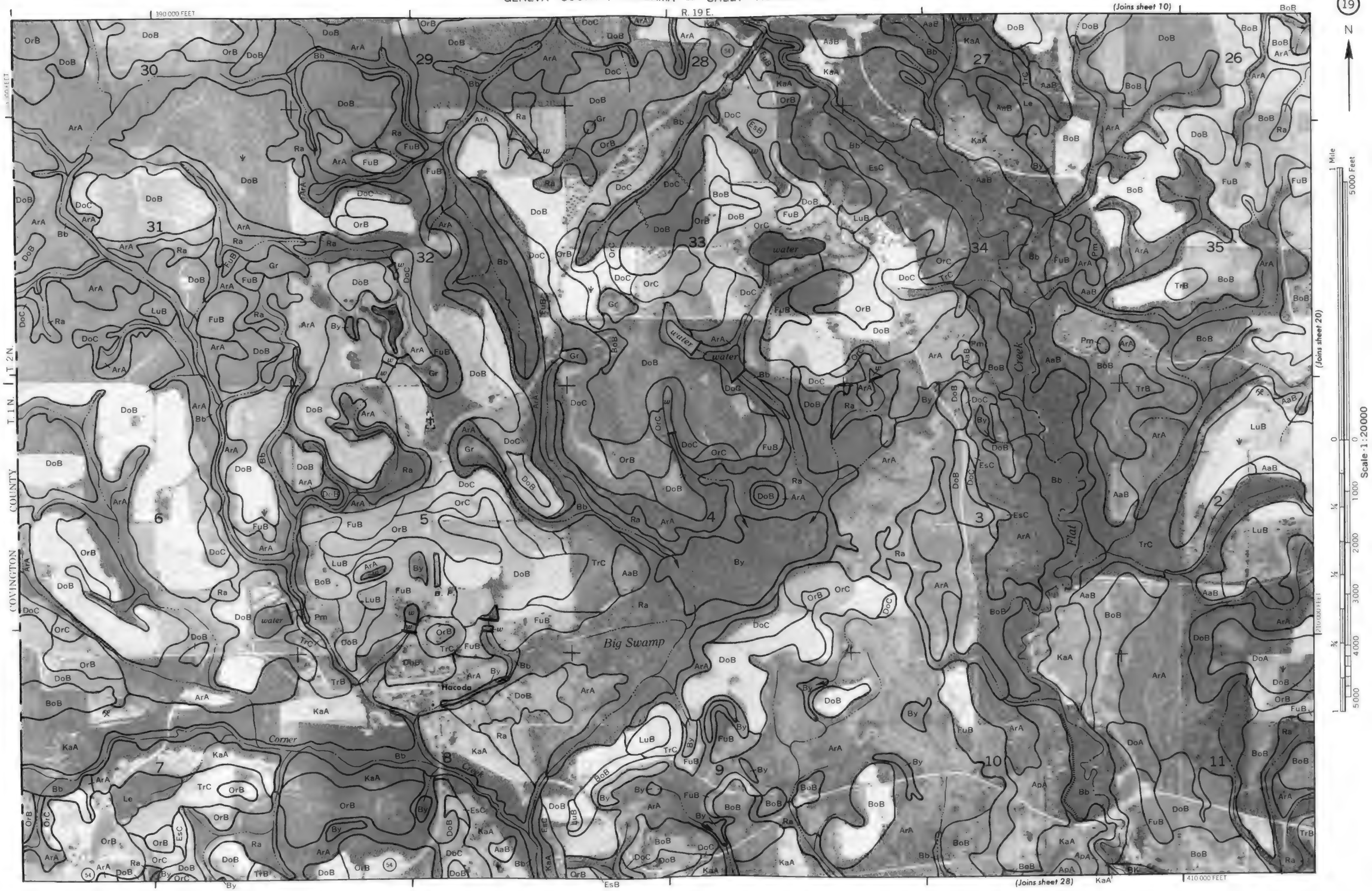
Newton

Creek

HOUSTON COUNTY

GENEVA COUNTY, ALABAMA NO. 18

GENEVA COUNTY, ALABAMA — SHEET NUMBER 19



GENEVA COUNTY, ALABAMA NO. 19

GENEVA COUNTY, ALABAMA — SHEET NUMBER 20

20

N

R. 19 E. | R. 20 E.

(Joins sheet 11)

415,000 FEET

220,000 FEET

T. 2 N.

T. 1 N.

1 Mile

5,000 Feet

Scale 1:20000

(Joins sheet 19)

(Joins sheet 29) | 415,000 FEET

(Joins sheet 21)

SAMSON

Pettits Fishponds

MUNICIPAL AIRPORT

Lewis High School

Mt. Pleasant Church

Ganer

Lime Springs Church

Lime Spring Lake

New Home Church

Lake Victoria

PEA RIVER

Sandy Creek

BK

This map is compiled on 1974 aerial photographs by the U. S. Department of Agriculture Soil Conservation Service and cooperating agencies.
Coordinate grid ticks and land division corners, if shown, are approximately plus or minus

GENEVA COUNTY, ALABAMA NO. 20

GENEVA COUNTY, ALABAMA — SHEET NUMBER 21

R. 20 E. | R. 21 E.

T. 1 N. | T. 2 N.

(Joins sheet 12)

(Joins sheet 20)

(Joins sheet 22)

(Joins sheet 30)

21

N

1 Mile

5000 Feet

Scale 1:20000

New Prospect Church

Louisville and Nashville

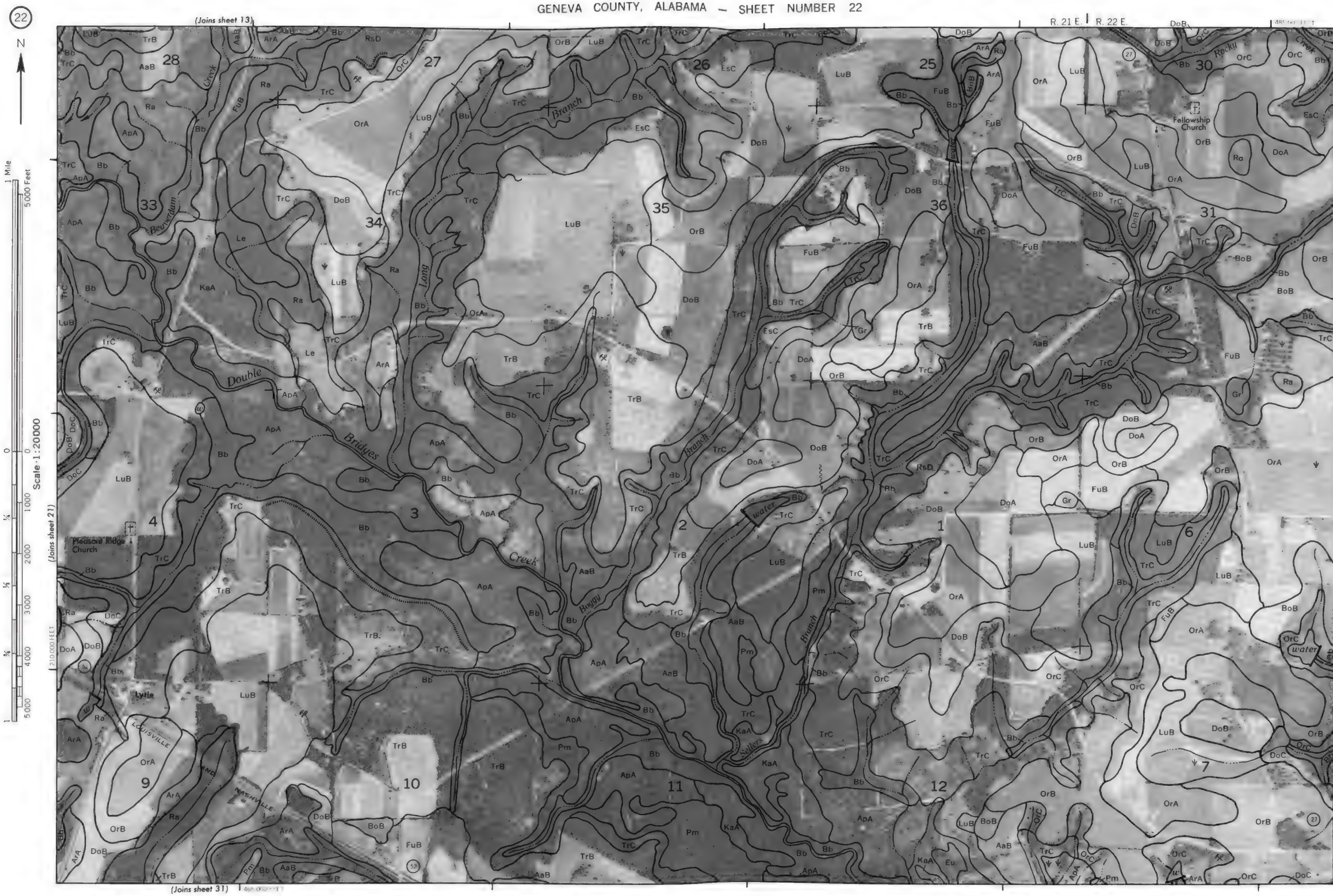
Double Bridges Creek

Sandy Branch

water

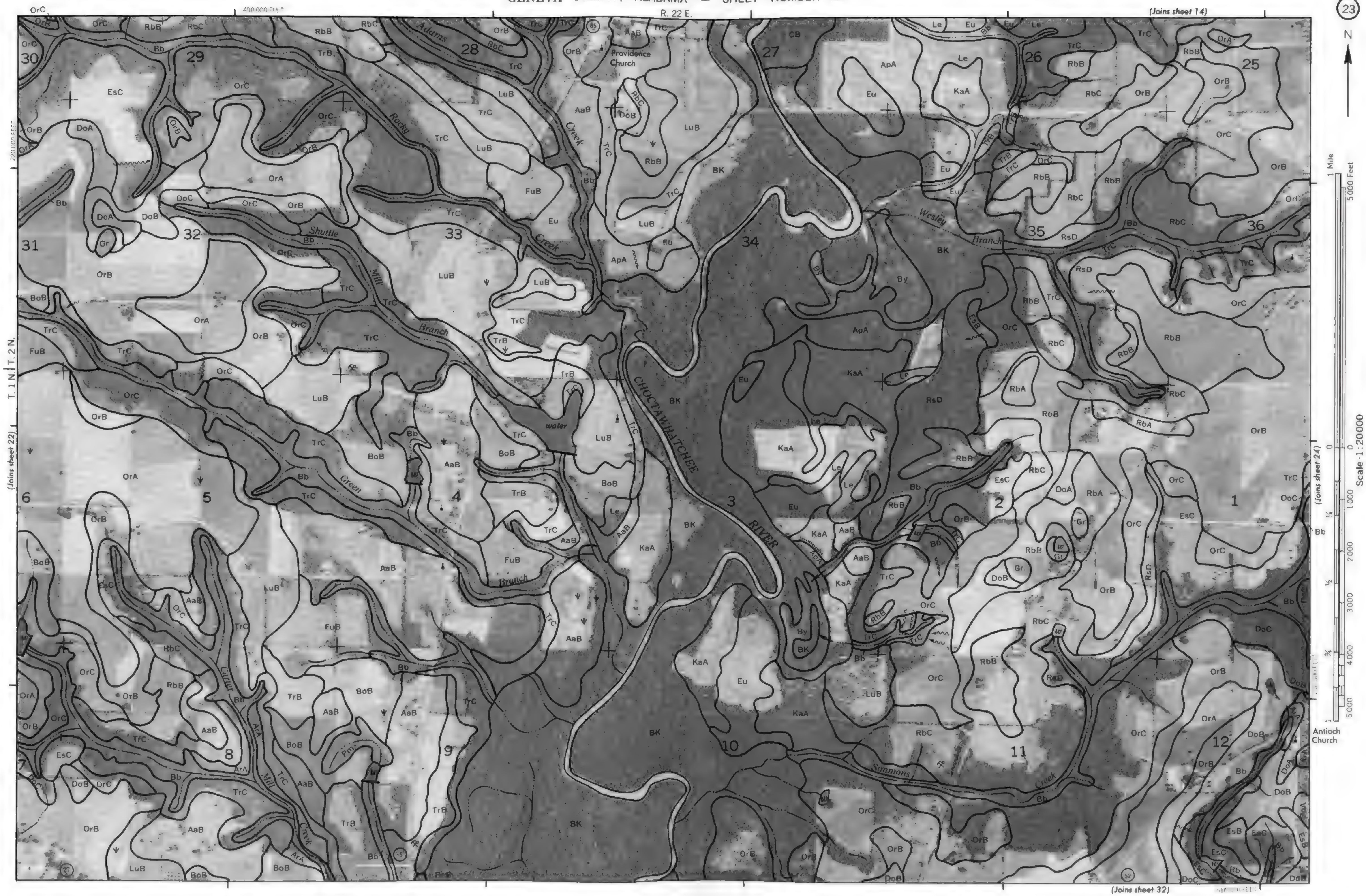
GENEVA COUNTY, ALABAMA NO. 21

This map is compiled on 1972 aerial photography by the U. S. Department of Agriculture Soil Conservation Service and cooperating agencies
Coordinate grid is cadastral and land division corners if shown are approximately positioned



This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

GENEVA COUNTY, ALABAMA NO. 22



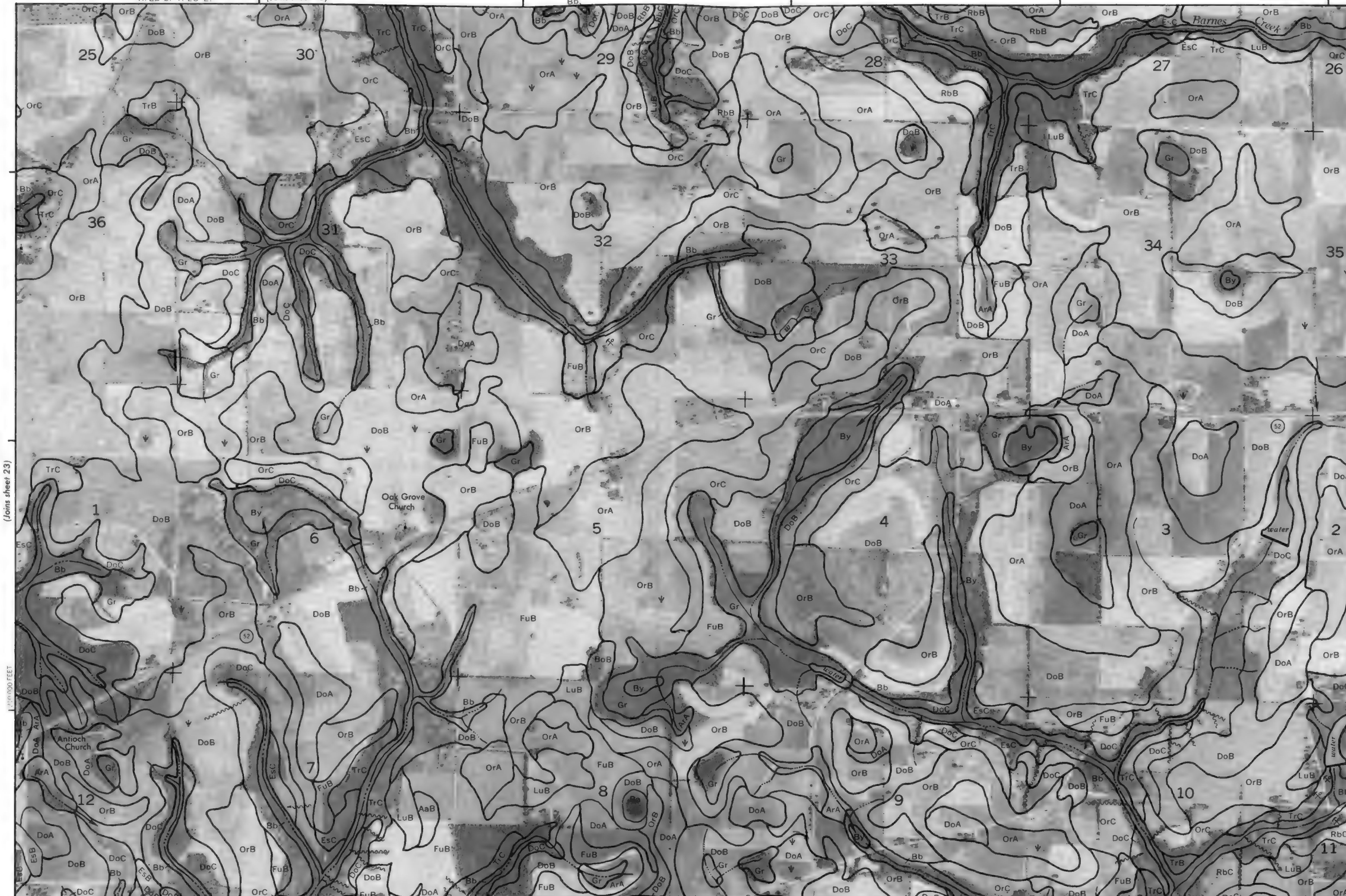
GENEVA COUNTY, ALABAMA NO. 23

This map is compiled on 1971 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N

R. 22 E. | R. 23 E.

(Joins sheet 15)



(Joins sheet 33)

(Joins sheet 23)

(Joins sheet 25)

Scale 1:20000

1 Mile
5000 Feet
0 1000 2000 3000 4000 5000

T. 1 N. | T. 2 N.

This map is compiled on 1974 aerial photography by the U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies.
Coordinate grid ticks and land division corners, if shown, are approximately positioned.

GENEVA COUNTY, ALABAMA — SHEET NUMBER 25

R. 23 E. | R. 24 E.

540,000 FEET

220,000 FEET

T. 1 N. | T. 2 N.

(Joins sheet 16)

(Joins sheet 24)

(Joins sheet 26)

(Joins sheet 34)

25

N

Scale 1:20000

1 Mile

5000 Feet

HARTFORD

HARTFORD Cemetery

Geneva High School

Daughtry Pond

Pondtown Church

Justice

Mill Creek

Little Creek

Hurricane Creek

Hurricane Church

SLOCOMB AND HARTFORD

GENEVA COUNTY, ALABAMA NO. 25

This map is compiled on aerial photography by the U. S. Department of Agriculture - Soil Conservation Service and cooperating agencies. Roads and land division corners shown are approximately positioned.

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

GENEVA COUNTY, ALABAMA — SHEET NUMBER 27

GENEVA COUNTY, ALABAMA NO. 27

R. 25 E.

T. 1 N.

T. 2 N.

(Joins sheet 18)

(Joins sheet 26)

(Joins sheet 36)

HOUSTON COUNTY

Christian Home Church

Burns Church

Martin Cemetery

Bethesda Church

Corinth Church

Immanuel Church

Water

Davis Mill Creek

Wrights Creek

Tindall Branch

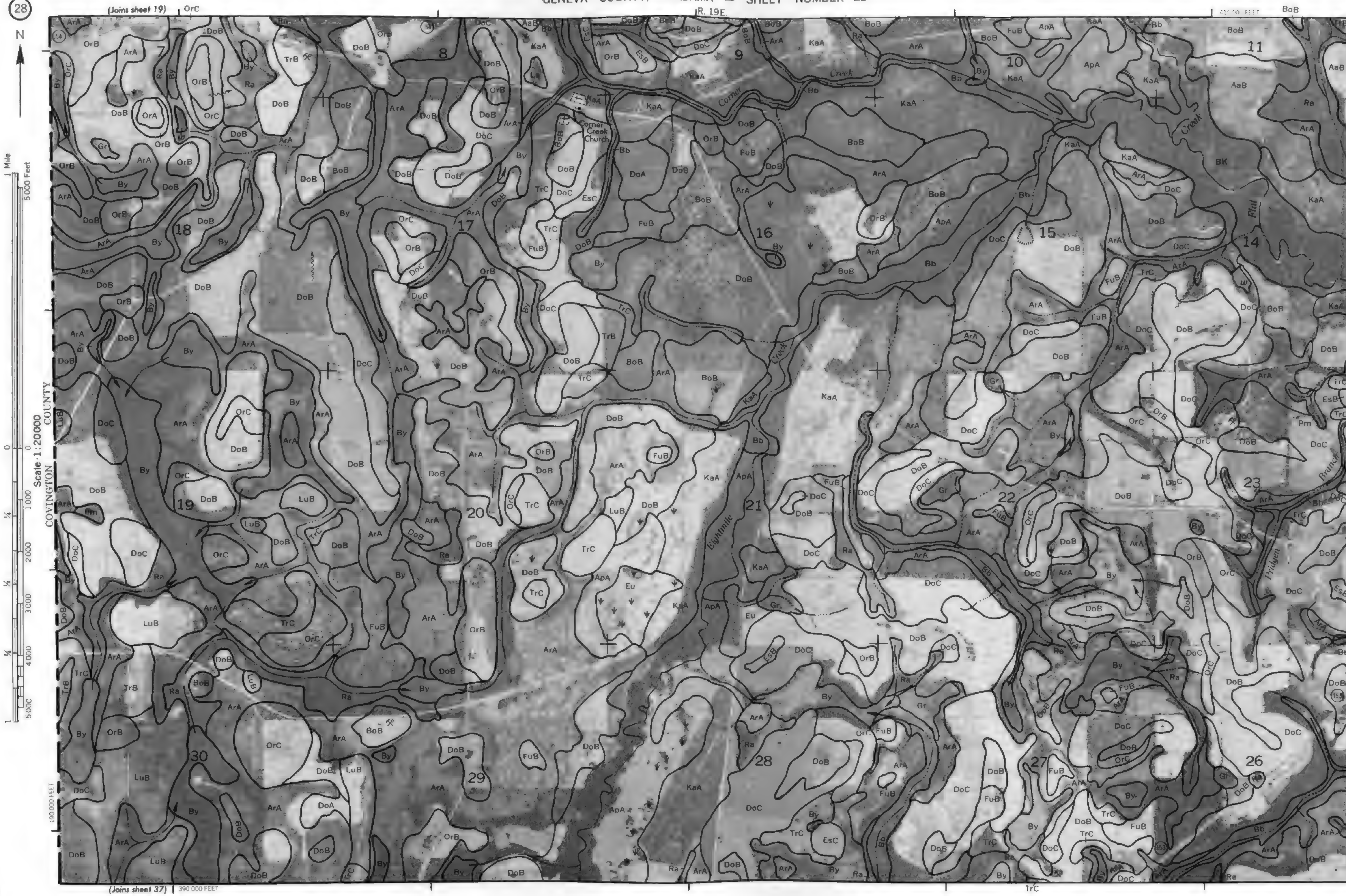
Chestnut Creek

Holmes Creek

Scale 1:20000

1 Mile

5000 Feet



This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

GENEVA COUNTY, ALABAMA NO. 28

GENEVA COUNTY, ALABAMA — SHEET NUMBER 29

GENEVA COUNTY, ALABAMA NO. 29

This image is compiled on 1974 aerial photography by the U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies.
Colored state grid ticks and land division corners, if shown, are approximately ticks/lines.

R. 19 E. | R. 20 E.

T. 1 N.

(Joins sheet 20)

(Joins sheet 28)

(Joins sheet 30)

(Joins sheet 38)

29

N

1 Mile

5000 Feet

Scale 1:20000

GENEVA COUNTY, ALABAMA — SHEET NUMBER 30

(30)

N

(Joins sheet 21)

R. 20 E.

R. 21 E.

T. 1 N.

(Joins sheet 31)

(Joins sheet 29)

(Joins sheet 39)

440 000 FEET

205 000 FEET

190 000 FEET

Scale · 1:20000

1 Mile

5000 Feet

Pumpkin Creek

Sandy Creek

Little Sandy Creek

Steep Hollow

Liberty Chapel

water

GENEVA COUNTY, ALABAMA NO. 30

This map was compiled on 1974 aerial photography by the U.S. Department of Agriculture Soil Conservation Service and cooperating agencies
Soil boundaries and land division corners shown are approximately positioned
Coordinate grid ticks and land division corners shown are approximately positioned

GENEVA COUNTY, ALABAMA NO. 31

R. 21 E. | R. 22 E.

(Joins sheet 22)

T. 1 N.

(Joins sheet 30)

(Joins sheet 32)

(Joins sheet 40)

485 000 FEET

1 Mile

5000 Feet

Scale 1:20000

N

31

Laddon Church

McDuffie Cemetery

GENEVA

Geneva High School

BORROW PIT

Double Bridges Creek

Laddon Creek

Limestone Branch

Sandy Creek

Threemile Branch

PEA RIVER

LOBELVILLE

NASHVILLE

LANDON

GENEVA COUNTY, ALABAMA — SHEET NUMBER 32

R. 22 E.

(32)

N

(Joins sheet 23)

(Joins sheet 31)

(Joins sheet 41)

(Joins sheet 33)

T. 1 N.

1 Mile

5000 Feet

Scale 1:20000

GENEVA

Double

Bridges

Creek

Mill

Creek

water

Marlin

Branch

RIVER

CHOCTAWHATCHEE

Lake Geneva

NASHVILLE

LOUISVILLE

AND

PEA RIVER

BORROW PIT

water

Blue

Branch

Spring

Creek

Wheeler

Mill

Branch

ALABAMA NO. 32

GENEVA COUNTY, ALABAMA

This map was compiled on 1974 aerial photographs by the U. S. Department of Agriculture Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners if shown are approximately correct.

GENEVA COUNTY, ALABAMA — SHEET NUMBER 33

GENEVA COUNTY, ALABAMA NO. 33

This map was compiled on 1974 aerial photographs by the U.S. Department of Agriculture Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners if shown are approximately positioned

R. 22 E. | R. 23 E.

T. 1 N.

(Joins sheet 32)

(Joins sheet 24)

(Joins sheet 34)

(Joins sheet 42)

N

1 Mile

5000 Feet

Scale 1:20000

GENEVA COUNTY, ALABAMA – SHEET NUMBER 34

34

N

R. 23 E. | R. 24 E.

T. 1 N.

(Joins sheet 25)

(Joins sheet 33)

(Joins sheet 43)

(Joins sheet 35)

1 Mile

5000 Feet

Scale · 1:20000

Hartford Lake

BORROW PIT

Christian Home Church

Millville Church

Hurricane Creek

Spring Creek

water

GENEVA COUNTY, ALABAMA NO. 34

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture Soil Conservation Service and cooperating agencies
Coordinate grid ticks and land division corners, if shown, are approximate if not surveyed

GENEVA COUNTY, ALABAMA — SHEET NUMBER 35

GENEVA COUNTY, ALABAMA NO. 35

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies.
Coordinate grid ticks and land divisions on corners. Roads shown are approximately positioned.

R. 24 E. R. 25 E.

(Joins sheet 26)

T. 1 N.

(Joins sheet 34)

(Joins sheet 36)

(Joins sheet 44)

580 000 FEET

New Post Oak Church

New Tegman Church

Wrights Church

Hurricane Creek

Pine Log Branch

Wolfpen Branch

Grant Branch

Wrights Creek

Scale 1:20000

1 Mile

5000 Feet

GENEVA COUNTY, ALABAMA — SHEET NUMBER 36

(36)

N

R. 25 E.

(Joins sheet 27)

(Joins sheet 35)

(Joins sheet 45)

605 000 FEET

585 000 FEET

T. 1 N.

T. 1 S.

HOUSTON COUNTY

GENEVA COUNTY, ALABAMA NO. 36

Scale · 1 : 20000

1 Mile

5000 Feet

0

1000 2000 3000 4000 5000

Wrights Creek

Holmes Creek

Fadette

New Hinson Church

Mt. Calvary Church

Pleasant Grove Church

water

This map was compiled on 1974 aerial photography by the U. S. Department of Agriculture Soil Conservation Service and cooperating agencies
Coordinate grid ticks and land division corners, if shown, are approximately positioned

GENEVA COUNTY, ALABAMA — SHEET NUMBER 37

N

R. 19 E.

390 000 FEET

185 000 FEET

COVINGTON COUNTY

T. 1 N.

T. 6 N.

(Joins sheet 28)

(Joins sheet 38)

New Mt. Zion Church

Natural Bridge Creek

Eightmile Creek

Eightmile Church

WALTON COUNTY FLORIDA

R. 19 W.

410 000 FEET

175 000 FEET

1 Mile

5000 Feet

Scale 1:20000

GENEVA COUNTY, ALABAMA NO. 37

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture Soil Conservation Service and cooperating agencies.
Coordinate grid ticks and land divisions shown are approximately positioned

GENEVA COUNTY, ALABAMA — SHEET NUMBER 38

38

N

R. 19 E. | R. 20 E.

(Joins sheet 29)

435,000 FEET

T. 6 N. | T. 1 N.

(Joins sheet 39)

185,000 FEET

1 Mile

5,000 Feet

Scale 1:20000

(Joins sheet 37)

415,000 FEET

R. 19 W. | R. 18 W.

WALTON COUNTY FLORIDA

HOLMES COUNTY

Reese Church

Lime Branch

Gin Creek

PEA RIVER

water

This map is compiled on 1969 aerial photographs by the U. S. Department of Agriculture Soil Conservation Service and cooperating agencies
Coordinate grid ticks and land division corners if shown are approximately positioned

GENEVA COUNTY, ALABAMA NO. 38

GENEVA COUNTY, ALABAMA — SHEET NUMBER 39

39

N

R. 20 E. | R. 21 E.

(Joins sheet 30)

185 000 FEET

440 000 FEET

(Joins sheet 38)

(Joins sheet 40)

T. 6 N. | T. 1 N.

HOLMES COUNTY FLORIDA

R. 18 W. | R. 17 W.

460 000 FEET

175 000 FEET

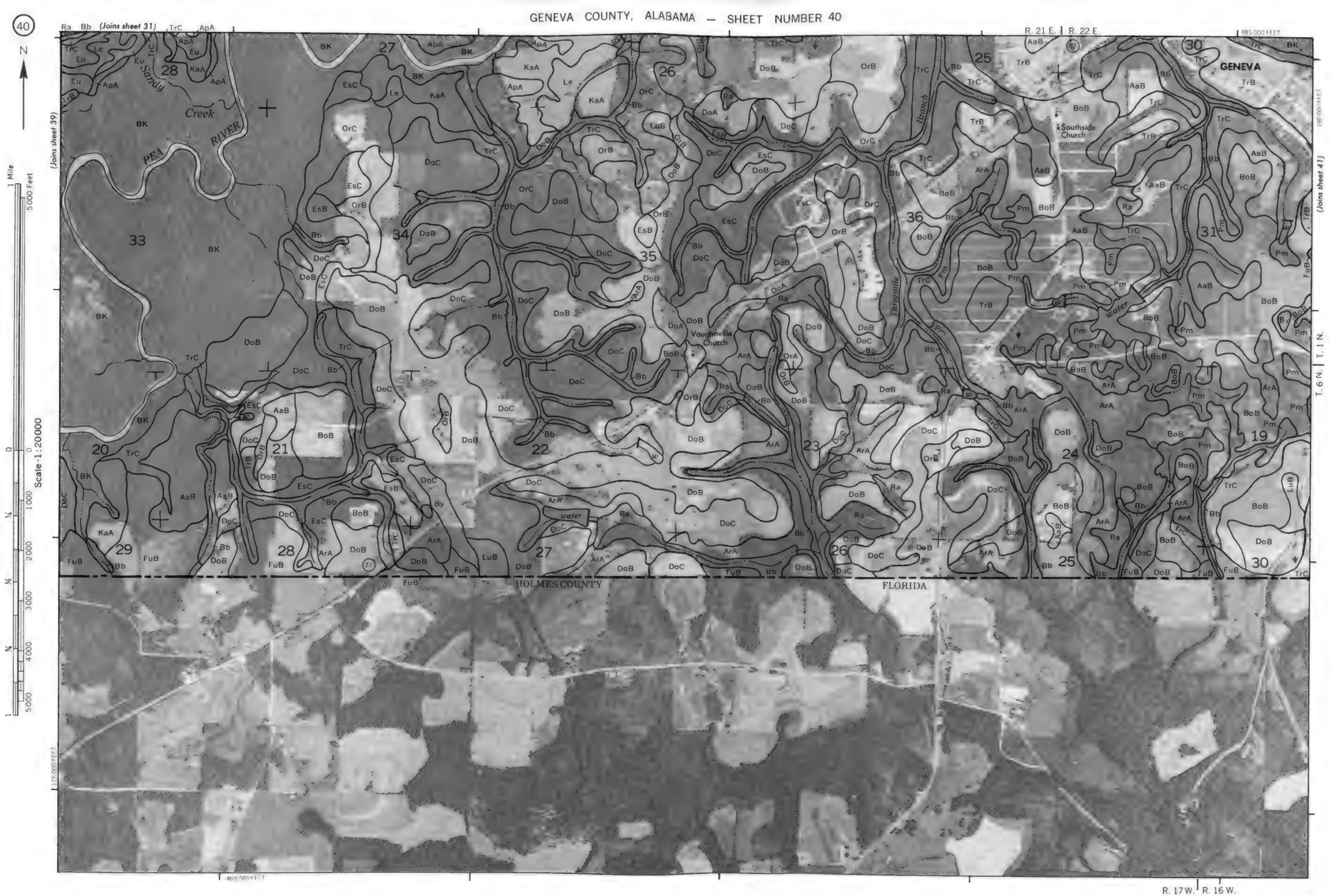
1 Mile

5000 Feet

Scale 1:20000

GENEVA COUNTY, ALABAMA NO. 39

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture Soil Conservation Service and cooperating agencies
Coordinate grid ticks and land division corners, if shown, are approximately positioned



GENEVA COUNTY, ALABAMA NO. 40

GENEVA COUNTY, ALABAMA — SHEET NUMBER 41

GENEVA COUNTY, ALABAMA NO. 41

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies.
Coordinate grid ticks and land division corners, if shown, are approximately positioned.

41

N

1 Mile
5000 Feet

Scale 1:20000

490 000 FEET
510 000 FEET
190 000 FEET
175 000 FEET

R. 22 E.
R. 16 W.

T. 6 N.
T. 1 N.

(Joins sheet 32)
(Joins sheet 40)
(Joins sheet 42)

PEA RIVER
CHOCTAWHATCHEE RIVER
Ice Factory Branch
Flowers Branch
Spring Creek
Smith Branch
Wide Branch
LOUISVILLE & NASHVILLE RAILROAD
Spring Hill Church
St. James Church

HOLMES COUNTY
FLORIDA

GENEVA COUNTY, ALABAMA — SHEET NUMBER 42

(42)

N

(Joins sheet 33) R. 22 E. | R. 23 E.

535 000 FEET

190 000 FEET

T. 7 N. | T. 1 N.

(Joins sheet 41)

(Joins sheet 43)

Scale 1:20000

1 Mile

5000 Feet

Louisville

Thurston

Pleasant Home Church

Branch

Smith

Black

Bonifay

Ana

Nashville

Bronch

HOLMES COUNTY

FLORIDA

175 000 FEET

515 000 FEET

R. 16 W. | R. 15 W.

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture. Soil Conservation Service and cooperating agencies.
Coordinate grid ticks and land division corners, if shown, are approximately positioned.

GENEVA COUNTY, ALABAMA NO. 42

GENEVA COUNTY, ALABAMA — SHEET NUMBER 43

GENEVA COUNTY, ALABAMA NO. 43

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies.
Coordinate grid ticks and land division corners, if shown, are approximately positioned.

R. 23 E. | R. 24 E.

540 000 FEET

190 000 FEET

T. 7 N. | T. 1 N.

(Joins sheet 34)

(Joins sheet 42)

(Joins sheet 44)

HOLMES COUNTY FLORIDA

LOUISVILLE & NASHVILLE

Cannon Branch

Poplar Creek

Tennile Creek

R. 14 W. | R. 15 W.

560 000 FEET

175 000 FEET

43

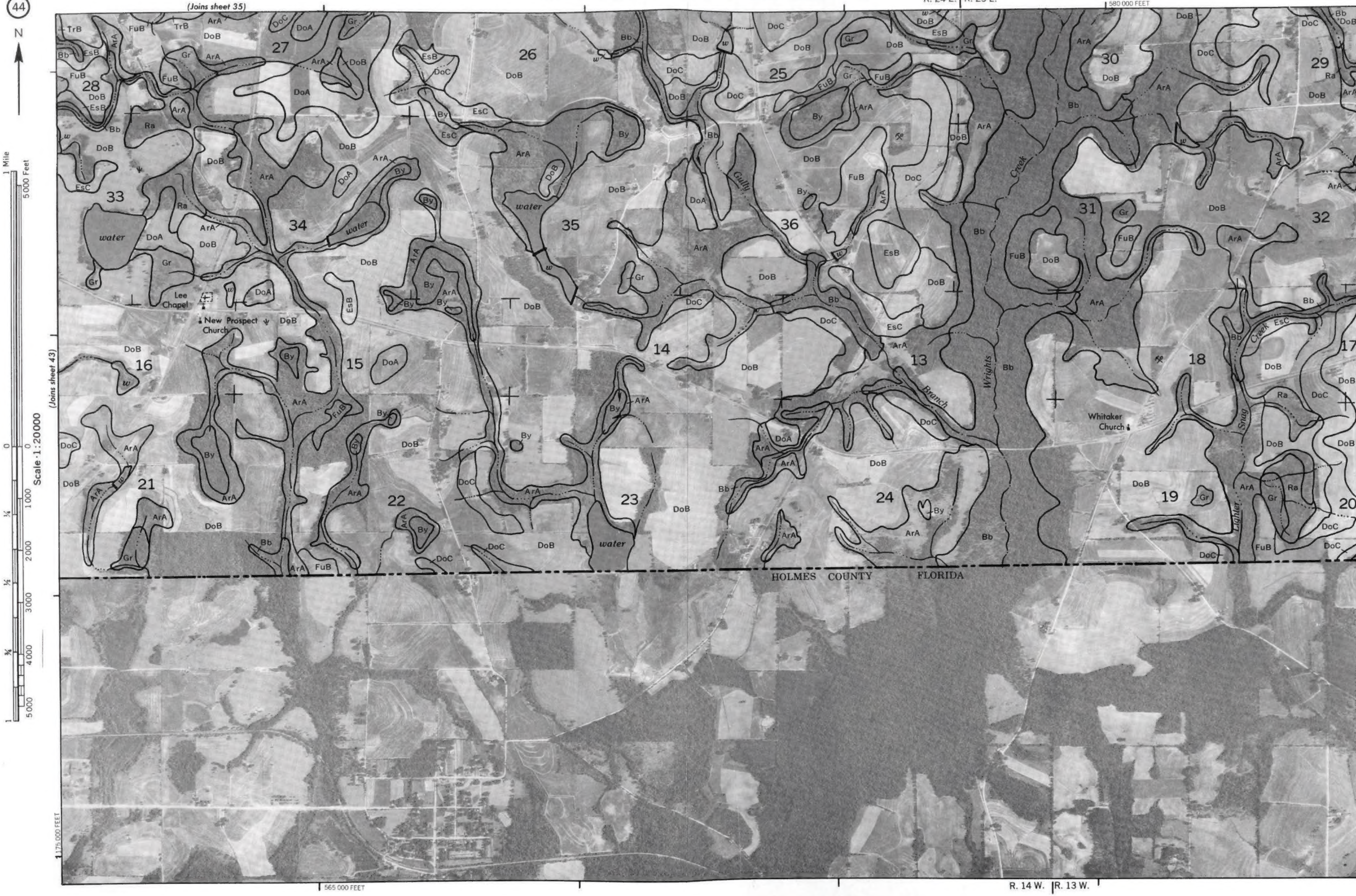
N

1 Mile

5000 Feet

Scale 1:20000

GENEVA COUNTY, ALABAMA — SHEET NUMBER 44



This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

GENEVA COUNTY, ALABAMA NO. 44

GENEVA COUNTY, ALABAMA — SHEET NUMBER 45

(Joins sheet 36)

(Joins sheet 44)

585 000 FEET

605 000 FEET

190 000 FEET

175 000 FEET

R. 25 E.

T. 7 N. | T. 1 N.

45

N

1 Mile

5000 Feet

Scale 1:20000

HOLMES COUNTY FLORIDA

JACKSON COUNTY FLORIDA

HOUSTON COUNTY

Mt. Calvary Church

Antioch Church

Pilgrims Rest Church

Bruce Creek

Lightner Creek

Holmes Branch

GENEVA COUNTY, ALABAMA NO. 45

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture. Soil Conservation Service and cooperating agencies.
Coordinate grid ticks and land division corners, if shown, are approximately positioned.